Spring 5-16-2020

Evaluating the Effectiveness of Integrated Care Interventions for Individuals with Serious Mental Illness

Roxanne Kennedy
University of Pennsylvania, krox@upenn.edu

Evaluating the Effectiveness of Integrated Care Interventions for Individuals with Serious Mental Illness

Abstract

Purpose: Individuals with serious mental illness (SMI) die 15-25 years sooner than the general population and typically have preventable co-morbid medical illnesses. Behavioral Health Home (BHH) is an integrated care intervention designed to coordinate physical and behavioral health care for individuals with SMI with expectation of improved health outcomes. This study was to determine to what extent BHH and BHH with Primary Care intervention models have an impact on Medicaid members' health outcomes, and were these BHH interventions more effective in improving healthcare outcomes, costs and utilization than treatment as usual (TAU). Method: Using state administrative data, this quasi-experimental longitudinal study compared health outcomes of individuals with SMI who were receiving BHH intervention (n=322) with those receiving BHH & Primary Care intervention (n=91); comparing individual's health outcomes to the first year in the intervention to their second year in interventions; and, comparing healthcare utilization and costs of both groups to one receiving TAU (n=823). A difference-in-differences design was used to isolate the effect of BHH participation on healthcare costs and utilization outcomes calculated for all individuals in pre and post-intervention period. Results: Both BHH interventions had an impact on health care costs and utilization compared to TAU with fewer inpatient hospitalizations, physical health related and ED visits, while both BHH interventions costs increased due to a surge in behavioral healthcare spending. Conclusions: This study elucidates the need to evaluate longer-term impact of BHHs and other integrated care models for individuals with SMI on both Medicaid spending and change in health outcomes.

Degree Type

Dissertation

Degree Name

Doctor of Social Work (DSW)

First Advisor

Solomon, Phyllis; University of Pennsylvania

Second Advisor

Manderscheid, Ronald; John Hopkins, Bloomberg School of Public Health

Third Advisor

Cantor, Joel; Center for State Health Policy, Rutgers University

Keywords

Medicaid, Behavioral Health Home, serious mental illness, coordinated care, integrated care, health outcomes

Subject Categories

Social and Behavioral Sciences | Social Work

EVALUATING THE EFFECTIVENESS OF INTEGRATED CARE INTERVENTIONS FOR INDIVIDUALS WITH SERIOUS MENTAL ILLNESS

Roxanne M. Kennedy, MSW, LCSW

A DISSERTATION

In

Social Work

Presented to the Faculties of the University of Pennsylvania

In

Partial Fulfillment of the Requirements for the

Degree of Doctor of Social Work

2020

Phyllis Solomon, PhD
Dissertation Chair, School of Social Policy and Practice

Sara S. Bachman, PhD
Dean, School of Social Policy and Practice

Dissertation Committee:

Joel C. Cantor, ScD
Dissertation Co-Chair
Center for State Health Policy, Rutgers University

Ronald Manderscheid, PhD
Dissertation Co-Chair
John Hopkins, Bloomberg School of Public Health

Dedication

To my family and friends who supported me on this journey, I am truly thankful. To my children, Jimi and Sophia, you give me reason to continue to strive to make this world a better place and provide hope for a brighter future. And to my mom, who never stopped believing in me and encouraging me to keep going, I am eternally grateful.

And a special dedication to my fellow DSW, NJ colleague and friend, Patrick Vance. You are gone too soon but your work and contributions here on this earth were meaningful and valuable to many. Rest in peace my friend.

Acknowledgements:

I would like to thank Dr. Phyllis Solomon for her guidance, patience and support throughout this dissertation process, from conceptualization to completion. In addition, I would like to thank Drs. Manderschied and Cantor for their willingness to advise me as part of my dissertation committee.

I would like to thank the New Jersey Department of Human Services, Division of Medical Assistance and Health services for their collaboration on this project, especially former Medicaid Director Meghan Davey and Business Intelligence lead Joseph Vetrano.

And lastly, I want to thank Kristen Lloyd, Statistician, for her amazing analytical skills and eager spirit. I am forever grateful to Kristen for jumping in and assisting with the statistical analysis of my dissertation data.

ABSTRACT

EVALUATING THE EFFECTIVENESS OF INTEGRATED CARE INTERVENTIONS FOR INDIVIDUALS WITH SERIOUS MENTAL ILLNESS

Roxanne M. Kennedy, MSW, LCSW

Phyllis Solomon, PhD

Purpose: Individuals with serious mental illness (SMI) die 15-25 years sooner than the general population and typically have preventable co-morbid medical illnesses. Behavioral Health Home (BHH) is an integrated care intervention designed to coordinate physical and behavioral health care for individuals with SMI with expectation of improved health outcomes. This study was to determine to what extent BHH and BHH with Primary Care intervention models have an impact on Medicaid members' health outcomes, and were these BHH interventions more effective in improving healthcare outcomes, costs and utilization than treatment as usual (TAU). Method: Using state administrative data, this quasi-experimental longitudinal study compared health outcomes of individuals with SMI who were receiving BHH intervention (n=322) with those receiving BHH & Primary Care intervention (n=91); comparing individual's health outcomes to the first year in the intervention to their second year in interventions; and, comparing healthcare utilization and costs of both groups to one receiving TAU (n=823). A difference-in-differences design was used to isolate the effect of BHH participation on healthcare costs and utilization outcomes calculated for all individuals in pre and post-intervention period. Results: Both BHH interventions had an impact on health care costs and utilization compared to TAU with fewer inpatient hospitalizations, physical health related and ED visits, while both BHH interventions costs increased due to a surge in behavioral healthcare spending. Conclusions: This study elucidates the need to evaluate longer-term impact of BHHs and other integrated care models for individuals with SMI on both Medicaid spending and change in health outcomes.

Table of Contents

List of Tables:

List of Illustrations:

CHAPTER 1 – BACKGROUND AND SIGNIFICANCE

Problem Statement

A report published in 2006 by the National Association of State Mental Health Program Directors (NASMHPD) Medical Director's Council indicates that individuals with a diagnosis of serious mental illness (SMI) die, on average, 25 years younger than members of the general U.S. population. This Report provides evidence that individuals with SMI die of natural causes or preventable diseases, have higher modifiable risk factors affected by psychotropic medication and various factors affecting their access to healthcare (National Association of State Mental Health Program Directors, October 2006). There has been much research on the earlier mortality of individuals with serious mental illness dating back to information collected in 1927 by Dr. Benjamin Malzberg (1932). Despite the breadth of research on SMI and comorbidity, the early mortality rate remains high for individuals with SMI.

In 2007, the Substance Abuse and Mental Health Services Administration (SAMHSA) announced "The 10 By 10 Campaign: A National Wellness Action Plan to Improve Life Expectancy by 10 Years for People with Mental Illness" (Substance Abuse and Mental Health Services Administration, 2007). The goal of this Campaign is to increase the lifespan of individuals with SMI so that by 2017, individuals with SMI will have lived 10 years longer than statistically indicated for the population in 2007. In order to assist in the implementation of the "10 By 10" initiative, through grant mechanism, SAMHSA has funded various

integrated care models throughout the US and its territories. With the change in administration at SAMHSA and the current opioid crisis, there has been a shift in focus to addressing opioid use disorder (OUD). In a recent correspondence by Dr. McCance-Katz, Assistant Secretary for Mental Health and Substance Use at the US Department of Health and Human Services, Dr. McCance Katz discusses the 21st Century Cures Act in 2018 that primarily addresses OUD funding, training and technical assistance and implementation of evidenced based practices to treat behavioral health disorders (McCance-Katz, 2018). There is no mention of integrated care or reference of the previous administrations "The 10 by 10 Campaign" or its progress. There are different models of integration established to provide coordinated physical and behavioral health care to individuals with SMI. Most of the models are based in either a primary care setting with behavioral health staff or based in a behavioral health setting with medical staff.

For ongoing sustainability of these integrated care interventions, the Affordable Care Act offers a provision for states to seek federal financial participation through Medicaid reimbursement of integrated services by a State Plan Amendment with the implementation of health homes or behavioral health homes (BHH). Health homes that receive federal funding through the Centers for Medicare and Medicaid Services (CMS) are required to incorporate the components of care coordination, care management, health and wellness activities, family and individual support services, transitional services and coordination of support services (SAMHSA-HRSA, May 2012).

The literature reviewed relevant to the concepts of this study recommend that further evaluation of the integrated care models is imperative to guide the design of integrated physical and behavioral health care for individuals with serious mental illness and to promote funding of effective integrated care models. This study employed a quasi-experimental study to test the hypothesis that individuals with SMI who participate in the integrated care interventions will have improved health outcomes and there will be a significant reduction in their healthcare costs and utilization compared to the individuals with SMI who are receiving treatment as usual (TAU). It is important to test this hypothesis in order to validate the effectiveness of the integrated care interventions by measuring the impact on health outcomes for individuals with SMI and the impact it has on the Medicaid system regarding funding. Although this is a quasi-experimental study, it may provide the framework for other similar study designs and may potentially inform the public policy decisions regarding future funding and implementation of integrated care interventions.

This study seeks to answer the following questions: To what extent do the BHH and the BHH with Primary care intervention models have an impact on the health outcomes (i.e. body mass index, blood pressure) of individuals with SMI in the interventions? Is the BHH with Primary Care intervention more effective than a BHH that has not added Primary Care in improving the health outcomes of individuals with SMI? And, do individuals with SMI in both the integrated care interventions have a greater reduction in healthcare costs and utilization than individuals with SMI receiving TAU?

Background and Significance

Over the last twenty-five years, there has been increasing attention to the health care needs of the individuals with mental health diagnoses in the United States. In 1993, the US epidemiological study of mental and addictive disorders service system discovered that there was a high frequency of mental disorders and more than half did not seek treatment and of those that did, they initially sought treatment through medical systems highlighting the need for integrated care (Reiger, Narrow, Rae, Manderscheid, Locke & Goodwin, 1993). In 1999, the Surgeon General released its first report on mental health (Surgeon General, 1999). This report identified the many barriers to mental health treatment including the separate treatment of the physical and mental health and access to care and presented recommendations to improve mental health care through parity in payment for mental health care with healthcare.

In 2001, the Institute of Medicine (IOM) released a report *Crossing the Quality Chasm* that was initially developed to address issues of patient safety (IOM, 2001). The IOM Report developed six "Aims for Improvement": safety, effectiveness, patient centeredness, timeliness, efficiency and equity. This Report concluded with stating that the current health care system designs could not meet the six aims and recommended changes needed to occur at various levels of the healthcare system. These levels included patient experience, microsystems of care, health care organizations, and health care environment including financing (Institute of Medicine (US). Committee on Quality of Health Care in America, 2001).

In 2006, the National Association of State Mental Health Program Directors (NASMHPD) Report on morbidity and mortality of people with serious mental illness

brought national attention to the fact that individuals with SMI die 15-25 years sooner than the general population (October 2006). The Report called for the designation of the SMI population to be a health disparities population. One of the several recommendations made in this Report is the call for integration of physical and behavioral health care for individuals with SMI.

Changes related to the way mental health and substance abuse benefits are financed (Pratt, Druss, Manderscheid, & Walker, 2016; Manderscheid & Kathol, 2014) began with the Paul Wellstone and Pete Domenici Mental Health Parity and Addiction Equity Act (MHPAEA) that was signed into law in 2008 (Wellstone & Domenici, 2008). This Federal law requires group health insurance plans (those with more than 50 insured employees) offer coverage for mental illness and substance use disorders to provide those benefits in no more restrictive way than all other medical and surgical procedures covered by the plan. With the approval of the Patient Protection and Affordable Care Act, also known as the ACA, states that choose to implement Medicaid Expansion were required to meet MHPAEA stipulations within their state's benefit plan including a mental health and substance use disorder benefit that had no quantitative or restrictions that were different from the medical benefits (2010). The MHPAEA is seen as progress toward integrating care for individuals with serious mental health issues and increasing access to care through financing parity (Druss & Goldman, 2018).

In 2005, Medicaid paid for 26 percent of all mental health and substance abuse services delivered in the US making it the largest source of payment for behavioral health

services (Substance Abuse and Mental Health Services Administration, 2010). With the advent of the Patient Protection and Affordable Care Act (ACA), the percentage of lives covered in Medicaid has grown given the fact that 37 states and the DC have adopted Medicaid Expansion under the ACA (Kaiser Family Foundation, 2019). In addition, the ACA offers new opportunities for states to seek federal financial participation through Medicaid reimbursement of integrated services that promote coordinated and person centered care through health home or behavioral health home options by a State Plan Amendment (ACA, 2010). A survey by Kaiser Commission on Medicaid and the Uninsured in 2012 reported that most states had or were planning initiatives in 2012 and 2013 to better coordinate care between physical and behavioral health care for individuals diagnosed with mental illness (Smith, Gifford, Ellis, Rudowitz, & Snyder, 2012). As of April 2013, 10 out of the 11 states that had filed a Medicaid health home State Plan Amendment to CMS included behavioral health conditions in their collaborative care model (Unützer, Harbin, & Druss, 2013). As of March 2019, 23 states and the District of Columbia have submitted Health Home State Plan Amendments with 38 approved health home models and 28 of these models focus on the treatment of integrated care for behavioral health of adults and children (Center for Medicare and Medicaid Services, 2019).

Integrated Care Models

Kodner and Spreeuwenberg (2002) recommended that integration needs to be from the "bottom-up, patient-centered perspective" to gain a true evaluation of healthcare integration and a holistic approach to treating individuals with special needs. In an article written about New York State integration models, Smith and colleagues (2013) describe integrating care

that “opens the door to collaboration, timely care, improved quality and parity for general medical and behavioral illness - and closes the door on disconnected treatment that is divisive, ineffective and inaccessible” (p. 828).

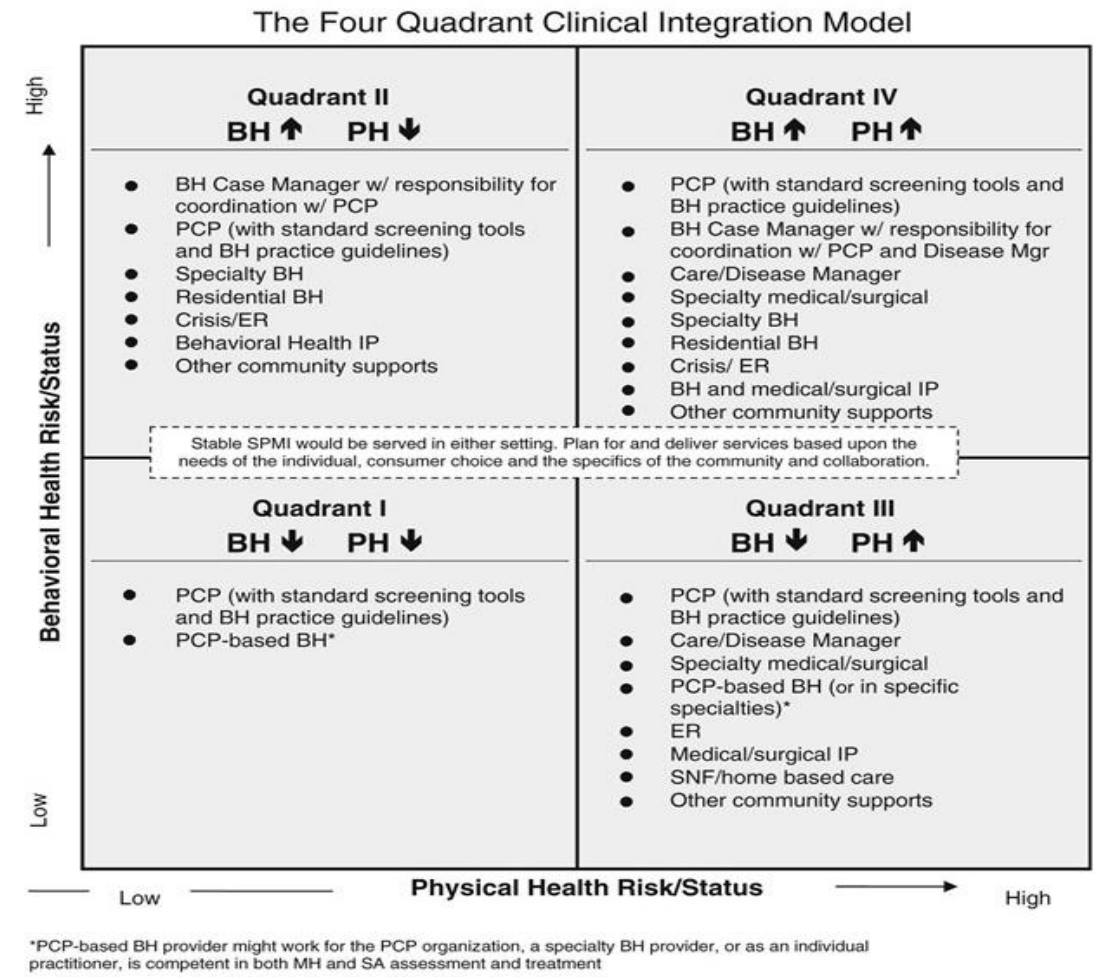
Some of the identified barriers to integrating health care for individuals with SMI include the silos of physical and behavioral health care, uncoordinated sharing of information, state and federal confidentiality laws regarding release of information, payment and parity issues (Collins & Fund, 2010; Pickett & Batia, 2015). For the individual with SMI seeking primary care services, access barriers exist including difficulty arranging appointments, getting to appointments, stigma from the primary care providers and lack of knowledge in navigating the healthcare system (Viron, et al., 2014) and a separate payment system (Manderscheid & Kathol, 2014).

Over the past several years, various models of care coordination and care integration both in the physical and behavioral health care domains have been developed with preliminary outcomes that show improved patient engagement and compliance with health care recommendations. These models emphasize the need for the patient to feel as though they are being heard, for the professional to be empathetic and for professionals to recognize the individual as part of the process.

In a report by Milbank Memorial Fund, the authors define the four concepts common to integrated care models as the medical home, the health care team, stepped care and the four quadrant clinical integration model (Collins & Fund, 2010). Under the auspices of the National Council of Community Behavioral Health Care, Mauer (2003) developed the

concept of the four quadrant clinical integration table to target integrated care models for individuals with physical and behavioral health care needs and suggested the ideal characteristics of treatment providers to provide care to individuals in each quadrant (see Illustration 1 below). Quadrant I are individuals with low behavioral health and physical health needs that can be met in a primary care physician's office. Quadrant II consists of individuals with high behavioral health needs and low physical health needs. Quadrant III is individuals with low behavioral health needs and high physical health needs. Quadrant IV is individuals with both high physical and behavioral health needs. Mauer goes on to report that individuals in Quadrant IV have lower medication adherence, higher incidence of co-occurring chronic medical conditions, higher incidence of co-occurring alcohol and drug abuse problems, lack of a stable medical home and more complex medical plans. The use of this Four Quadrant model is encouraged for policy makers and other stakeholders when determining the appropriate integrated care model for individuals with mental illness (Mauer, 2010; Parks, Pollack, Bartels, & Mauer, 2005). However, Mauer and Druss caution that "Regardless of the quadrant in which a person's mental health, substance use, and physical healthcare needs falls, there will always be a boundary between primary care and specialty MH/SU that must be addressed" (p. 532).

Illustration 1: National Council for Community Behavioral Healthcare Four Quadrant Model



(Mauer & Druss, 2010, p. 553, Figure 1)

The Milbank Memorial Fund Report describes three models of integrated care: collaborative care; coordinated and co-located; and, integrated (Collins & Fund, 2010). Some characteristics of collaborative care are a referral relationship between physical and behavioral health care providers, routine exchange of information between physical and behavioral health care providers, primary care delivering physical and behavioral health care interventions and consumer linkage to community resources. Characteristics of co-located

care are physical and behavioral health services in the same facility site, referral to physical and behavioral health care staff as needed and consultation between physical and behavioral health providers. Characteristics of an integrated care model are one treatment plan with behavioral health and medical objectives, medical and physical health care services in the same facility site, medical and behavioral health care staff working on one team and the use of a single data base to monitor health outcomes.

In a study by Kennedy-Hendricks, Daumit, Choksy, Linden and McGinty (2018) of Maryland's Medicaid Health Home Models, it is emphasized that there needs to be an evaluation of the level of integrated care models to understand the progress for the individual. This study recommended integration measures established by the Agency for Healthcare Research and Quality (AHRQ) parameters which included nine areas: range of care team functions; range of expertise in core health home team; spatial arrangement; communication and information-sharing strategies used by the health home; consumer engagement protocols; access to consumer health data; access to consumer social data; comprehensiveness of shared care plans; and, systemic follow up of consumers. This study found that while there was improvement of information sharing in some models that could lead to improved health outcomes for consumers, more studies need to be done on the correlation of level of health home integration and how that effects client outcomes.

Coordinated Care Models in New Jersey

The BHH Intervention

The Behavioral Health Home (BHH) intervention is a model designed to integrate physical and behavioral health care in a community setting. Since it is a newer service, it has intentional flexibility built into the Federal requirements in order to meet the various needs of individuals with SMI and the diversity of state systems. The Center for Integrated Health Solutions published a BHH manual outlining the core clinical features of BHH (SAMHSA-HRSA, May 2012). The four principles of effective care outlined in this manual are person-centered care, population based care, data-driven care and evidence-based care. The clinical features of the BHH are self-management support, delivery system design, decision support, clinical information systems and community linkages. Case management is a large component of this service to prevent individuals from dropping out of services or not following up with physical or behavioral healthcare needs. In addition, the BHH model allows for the use of peer support personnel within the BHH service. A study that evaluated health screenings for adults with serious mental illness found that the use of peers in health risk screening "help to answer epidemiologic questions, provided targeted health education, and empower participants to better manage their medical needs." (Cook, et al., 2015, pg. 10).

For the purpose of this study, the BHH is coordinated physical and behavioral health care within a community mental health clinic staffed by nurses, social workers and peer wellness coaches. Since this BHH is receiving Medicaid funds, it is required to incorporate the components of care coordination, care management, health and wellness activities, family and individual support services, transitional services and coordination of support services

(SAMHSA-HRSA, May 2012). The staff of the BHH is responsible for coordinating all of the physical and behavioral health care needs of that individual. Some BHHs have on site physical healthcare providers, gyms, dieticians, and other health care professionals to provide convenient access for clients and to enhance professional collaborations. The BHH is not a time limited service but rather a "health home" where individuals have a consistent set of staff and services to assist them with their physical and behavioral health needs. The BHH service is intended to be lifelong service similar to the relationship many establish with their primary care or family doctor. The BHH in this study is considered a coordinated care service as defined by the Milbank Memorial Fund Report (Collins, et al., 2010).

Behavioral Health Home Provider with Primary Care (BHH-PC) Intervention

The intent of a behavioral health home provider adding a primary care service is to integrate the physical and behavioral health care needs of the individuals with mental illness. By having one medical record, one treatment plan and team, and co-location of services, these providers seek to ameliorate the silos and other barriers that exist for individuals with mental illness or substance abuse disorders to accessing medical care.

Although several of the services may be the same as the BHH intervention, BHH-PC requires the addition of a primary care provider, either physician or APN. In the collaborative care categories defined in the Milbank Memorial Fund Report (Collins, et al., 2010), the BHH-PC intervention could either be a co-located or integrated care model depending on what characteristics are present in the model.

For the purpose of this study, the BHH-PC intervention is defined as the behavioral health home provider who has added a primary care service and is also certified as a BHH by the NJ Division of Mental Health and Addiction Services. The additional staff of a primary care service is required to be considered a BHH-PC and the facility is licensed by the New Jersey Department of Health to provide on-site primary care services. The BHH-PC is responsible for the mental health and primary care services and is required to provide coordinated care for the individual using the primary care service with the BHH service. Like the BHH service, the BHH-PC is not a time limited service but rather a "health home" where individuals have a consistent set of staff and services to assist them with their physical and behavioral health needs.

Treatment as Usual (TAU) Intervention

The comparison group in this study is individuals with SMI who are receiving treatment in a community mental health center with the delivery of services that may include intensive case management, partial care or traditional outpatient treatment. Although individuals with SMI may have a case manager or individual assigned to them to assist with linkage to community services including physical health care, there is not a requirement for this to occur. Therefore, the TAU intervention would not be considered to fall within the domain of a collaborative care category since the characteristics of that model are not being required and not consistently delivered in the TAU (Collins, et al., 2010).

The staff of the TAU is responsible for providing the prescribed treatment plan in relationship to the individual's mental health. The TAU services are rehabilitative and

therefore are considered a time limited service in which individuals are treated with the intent that they will recover and progress to the lowest level of treatment needed to maintain stability in the community.

Health care of individuals with serious mental illness

Individuals with SMI have higher rates of medical illness than the general population and often they do not seek medical care (Harvard Mental Health Letter, 2003; Manderscheid, Druss, & Freeman, 2008; Parks, Svendsen, Singer, Foti, & Mauer, 2006). Lifestyle, modifiable risk factors such as smoking and obesity, and poor access to health care perpetuate the poor physical health of individuals with SMI (Dickerson et al., 2006; Mirza & Phelan, 2002; Parks et al., 2006). For the population of individuals diagnosed with SMI, research reveals that they primarily die of natural causes including cardiovascular disease, diabetes related conditions, respiratory disease and infectious diseases similar to the general population (Colton & Manderscheid, 2006; Jones et al., 2004; Manderscheid et al., 2008; Parks et al., 2006), but at a much younger age varying from 13 to 30 years earlier than the general population (Colton & Manderscheid, 2006). It has also been found that individuals with SMI use healthcare differently, i.e. greater frequency of emergency room visits and the use of emergency transportation than the general population and it is therefore suggested that more efficient and coordinated care for individuals with mental illness will provide more preventative care and hence will result in reductions in overall healthcare costs (Berren, Santiago, Zent, & Carbone, 1999; Manderscheid et al., 2008). A study of primary care medical homes found the population with SMI have a greater occurrence of comorbid physical health conditions and the results of the study recommend that health homes need to

target participation and utilization for individuals with SMI in primary care health home settings (Lichstein, et al., 2014). In a nationally representative study of individuals that were given a structured diagnostic interview, individuals with depression and anxiety had a 60% higher mortality rate and died 8 years sooner than individuals without these diagnoses (Pratt, Druss, Manderscheid, & Walker, 2016).

Several factors contribute to the poor health of individuals with SMI including the patient, provider and system issues that make it difficult to access physical healthcare (Berren et al., 1999; Parks et al., 2006). Druss, Rohrbaugh, Levinson and Rosenheck (2001) describes these factors as the patient being fearful and having social instability, the provider having competing demands, and the system being fragmented and having separate organizational structures. The studies reviewed recommend a coordinated healthcare system that incorporates physical and behavioral health and quantifying outcomes to be able to measure the effectiveness of the coordination of care for individuals with SMI (Colton & Manderscheid, 2006; Dickerson et al., 2006; Jones et al., 2004; Manderscheid et al., 2008; Parks et al., 2006).

Health outcome measures for individuals with SMI

The most striking factor that contributes to the fact that individuals with SMI die much sooner than the general population is their high rate of co-occurring medical conditions. A study about the prevalence of chronic medical conditions with SMI found that 74% of the individuals in the study with SMI had one chronic health condition and 50% had two more chronic health conditions (Jones, et al., 2004). The co-morbid physical health conditions are identified in multiple studies as diabetes, hyperlipidemia, cardiovascular disease

(hypertension, heart disease), respiratory disease, obesity, HIV/AIDS, (Hert et al., 2011; Lambert, 2012; Robson & Gray, 2007; Sokal et al., 2004) Hepatitis C (Lambert, 2012) and greater frequency of breast and lung cancers (Robson & Gray, 2007; Sokal et al., 2004). In a study conducted specific to individuals with a diagnosis of schizophrenia in the US, individuals with schizophrenia were 3.5 times more likely to die sooner than the standardized mortality ratio due to cardiovascular disease and respiratory related diseases such as lung cancer, pneumonia and chronic obstructive pulmonary disease (Olfson, et al 2015).

To further complicate medical conditions of individuals diagnosed with a mental illness, the psychotropic medications prescribed are known to contribute to an individual's obesity which increases the likelihood of a chronic medical condition. Statistics have shown that individuals treated for schizophrenia had a 42-60% rate of obesity, individuals treated for bipolar disorders have a 68% rate of obesity and individuals treated for major depression had a 57.8% rate of obesity (Hert et al., 2011). In 2015-2016, the United States trend for obesity was 39.8% for adults in the general population (Hales, Carroll, Fryar and Ogden, 2017).

In addition, individuals with serious mental illness have a higher incidence of metabolic syndrome than the general population (Toalson, Ahmed, Hardy, & Kabinoff, 2004) making this an important outcome measure for studies involving healthcare and individuals with SMI. Metabolic syndrome is the name for a group of factors that raises the risk for heart disease and other health problems, such as diabetes and stroke. The five risk factors for metabolic syndrome are a large waist line, a high triglyceride level, low HDL cholesterol level, high blood pressure and high fasting blood sugar. An individual who has at least three

metabolic risk factors is appropriate to be diagnosed with metabolic syndrome. The risk for heart disease, diabetes, and stroke increases with the number of metabolic risk factors present. In general, a person who has metabolic syndrome is twice as likely to develop heart disease and five times as likely to develop diabetes as someone who doesn't have metabolic syndrome. Other risk factors that contribute to the diseases associated with metabolic syndrome are smoking, diet, physical activity and drug and alcohol use/abuse (Hert, Schreurs, Vancampfort, & Winkel, 2009).

Therefore, to get a comprehensive measure of an individual with SMI health outcomes, it is necessary to measure indicators of metabolic syndrome which would reveal an individual's risk of developing cardiovascular disease, diabetes, hypertension and stroke if they are not already present. In addition, it is necessary to include measures in healthy lifestyle changes that would include smoking, physical activity, diet and drug and alcohol use.

Recent Integrated Care Findings

The U.S. Department of Health and Human Services commissioned a study of the Primary and Behavioral Health Care Integrations (PBHCI) Grants that were funded by the Substance Abuse and Mental Health Services Administration (SAMHSA) (Scharf et al., 2013). This report was published in December 2013 and evaluated the effectiveness of the PBHCI grantees that were first awarded by SAMHSA in 2009. This Report focused on measures of program features, consumer outcomes and process measures indicating whether integrated care was achieved. This Report's evaluation of consumer health outcomes was a study of three PBHCI sites and control clinic pairs over one year. Compared to the control group, the PBHCI group had greater reductions in indicators for metabolic syndrome

including hypertension, dyslipidemia, diabetes and cardiovascular disease. However, no benefits were noted for triglycerides, obesity and smoking of the PBHCI group over the control group. The Report indicated several limitations to the study including the small sample size, the implementation of a new service, use of one year of data, and the PBHCI grantees in the study did not represent enough diversity to support design features of the evaluation.

A one year study of California's Behavioral Health Integration and Complex Care Initiative (BHICCI) has revealed an improvement of participant's health outcomes and in some sites, a reduction in Medicaid costs related to decrease utilization of inpatient care (Gilmer, et al, 2018). In a one year study of an integrated care model that coordinated care between a community behavioral health clinic and a federally qualified health center (FQHC) with a comparison group, the intervention group had improvement of quality of medical care and coordinated physical health care but there was no statistical difference in health outcomes for the intervention group (Druss, et al, 2017). Both of these investigations recommend studies over a longer period of time to more effectively measure any changes in outcomes or decrease in costs.

Other studies involving outcomes for integrated care models for individuals with SMI provide more information about the effectiveness of these new service models. Pennsylvania has some preliminary evaluation findings completed by Mathematica Policy Research (Kim, Gerolamo, & Brown, 2013) on two of the integrated care models implemented over a two-year period from 2009-2011. In the Southeastern Pennsylvania integrated care models, there

was a 9%-14% decrease in emergency department use compared to the absence of the intervention; nurses enhanced the care team by bridging physical and behavioral health providers; and, the model based in a behavioral health agency was a natural fit for the integrated care model. In the Southwestern Pennsylvania integrated care model, there was a decrease in physical and behavioral health inpatient admissions; a decrease in emergency department use for one subgroup; the integrated care intervention engaged a large number of high risks clients; and, the use of the county's health plan integrated delivery system facilitated the implementation. Information from the Pennsylvania integrated care models recommends that considerations need to be taken into account about the vast systems change and the paradigm shift that is necessary to implement these models. In addition, the Pennsylvania report states that flexibility, directional guidance, data sharing and consumer participation are crucial to implementation (Kim et al., 2013). A later analysis of these same integrated care models recommends BHHs outcomes need to include an individual's improvement in functioning, quality of life, weight and hospital use (Gerolamo, et al., 2014). Another study of three counties in Pennsylvania's Medicaid integrated care models that added nurse navigators to behavioral health services found that there was a 4% decrease in emergency department use among the intervention group compared to the comparison group but there was no statistical difference in the frequency or readmissions to inpatient hospitalizations during 2009-2011 (Kim, Higgins, Esposito, & Hamblin, 2017)

Missouri has had a Medicaid State Plan Amendment that includes a community mental health center healthcare home since 2011 (Missouri HealthNet and the Department of Mental Health, 2012). A program designed to outreach Missouri's high cost utilizers through

the behavioral health home model yielded an increase in medication access, improvement in health care outcomes performance measures for chronic diseases and a decrease in utilization and Medicaid spending (Raney, 2015, p. 214). In addition, Missouri is requiring providers who participate in the community mental health home to collect indicators on asthma, blood pressure, cholesterol levels, diabetes, metabolic screen, body mass index and tobacco use so the state can monitor these health outcomes to determine service effectiveness (Missouri HealthNet and the Department of Mental Health, 2012).

New York State has implemented over 37 various models of health homes and is monitoring quality measures for continuity of care, engagement and retention, medication choice and adherence, and access to specialty behavioral health services (Smith et al., 2013). Another study from the University of Maryland showed that thirty-three (33) members in the BHH who had diabetes indicated a 12% stabilization of the HbA1c levels and 21% had an improvement in their HbA1c levels within the first 10 months of the BHH intervention (Maragakis, et al., 2015). In a study specific to New Jersey completed by the Rutgers Biomedical and Health Sciences Working Group on Medicaid High Utilizers, the first recommendation is to integrate physical and behavioral health care in models that treat the whole person due to the high costs of individuals that have mental health and/or substance use disorders diagnoses (Rutgers Biomedical and Health Sciences, 2016).

Integrated care financing and utilization

Recommendations regarding measuring the success of integrating physical and behavioral healthcare include evaluating health outcomes, overall healthcare costs and healthcare utilization among Medicaid members. Several studies promote the use of

Medicaid data sets to identify individuals with a SMI who have co-morbid medical conditions that are more likely to have higher healthcare costs who would benefit from an integrated care model (Boyd et al., 2010; Manderscheid et al., 2008; Smith et al., 2011). Other studies identify using States Medicaid data to evaluate the cost effectiveness and projected savings of integrated care services for individuals with SMI by measuring annual health care costs and utilization (Berren et al., 1999; Boyd et al., 2010; Jones et al., 2009; Manderscheid et al., 2008; Rhodes, et al, 2017; Druss, et al, 2017; Solis-Roman & Knickman 2017). In a study completed by Rutgers Biomedical and Health Sciences Working Group on Medicaid High Utilizers specific to New Jersey Medicaid members revealed that in 2013, 86.2% of the individuals in the top 1% of New Jersey's individuals with the highest Medicaid dollars spent had a diagnosis of a mental illness or substance use disorder and one-third of these individuals had an SMI (Rutgers Biomedical and Health Sciences, 2016).

Medicaid is the largest payer of behavioral health services in the US and the Medicaid dollars spent for behavioral health has increased from 17% in 1986 to 28% in 2005 (Mark, et al., 2011). With the advent of the Affordable Care Act, the Mental Health Parity and Addictions Equity Act and other federal health care reform efforts, the total Medicaid dollars spent is likely to be significantly higher for behavioral health services. A Report by the Milliman Foundation for the American Psychiatric Association states that individuals with a behavioral health disorder cost an estimated $525 billion annually and that there is an estimated 5-7% of Medicaid savings, an annual savings of seven (7) to nine (9) billion, by effective integration of physical and behavioral health care (Melek, Norris, & Paulus, 2014). The Report goes on to state that individuals with an SMI in an integrated care model have the

greatest projected savings of costs per member. However, in an earlier article, Melek (2012) cautions against the use of projected Medicaid savings for individuals with SMI due to the severity of the co-morbid medical disorders among individuals with behavioral health issues. In a study of Maine's Medicaid members, individuals with behavioral health disorders had greater utilization of physician services, emergency room, hospitalizations, 30-day readmissions and potentially avoidable hospitalizations and that the cost for behavioral health individuals was greater even if there wasn't the presence of a comorbid disorder (Freeman, et al., 2014).

Medicaid beneficiaries with disabilities have higher rates of multiple co-morbidities, especially psychiatric disorders and cardiovascular disease (Kronick, Bella, & Gilmer, 2009). Further, Medicaid beneficiaries with more than two chronic conditions account for 75% of the total Medicaid costs and 49% of Medicaid recipients with a disability have a psychiatric diagnosis (Kronick et al., 2009). In addition, 5% of the Medicaid beneficiaries account for 50% of the overall Medicaid funding, primarily due to multiple co-morbidities (Kronick et al., 2009).

A large study of a collaborative care model (N=1,801) for older adults with depression found savings in healthcare including pharmacy, inpatient and outpatient medical care, and mental health specialty care (Unützer et al., 2013). This study determined that by implementing a collaborative care service with an investment of $522 in year one resulted in a net savings of $3,363 in the next three consecutive year's corresponding to a $6.50 return on investment for every dollar spent or an average annual savings of $841 per member (Unützer

et al., 2013). A study by Chakravarty and Cantor (2016) from Rutgers University specific to New Jersey super utilizers or individuals with high inpatient and/or emergency department use, explored the regression to the means (RTM) of super utilizers in New Jersey. This study found that individuals with a low RTM (less of a decrease in overall healthcare costs) were more likely to have an SMI diagnosis, be on Medicaid or charity care, have a higher frequency of use of the emergency department and residency in a low income area identifying this group of super users as having the greatest potential for savings (Chakravarty & Cantor, 2016).

A study of the Pennsylvania Chronic Care Initiative (CCI), a patient centered medical home, revealed that high risk Medicaid individuals with comorbid medical and psychiatric disorders in the CCI had a $4,145.28 savings per patient per year over a comparison study group from 2008-2011, primarily due to a decrease in inpatient, mental health and substance abuse outpatient services and emergency department utilization (Rhodes, et al., 2017). A California study of an Accountable Care Organization (ACO) that incorporated behavioral staff saw a reduction in the emergency department (ED) utilization of 13% by participants post intervention and a reduction in overall Medicaid ED costs by $408,000 per year for the ACO population involved in the behavioral health services (Clark, et al, 2016). A study of Fountain House's Comprehensive Community system of care that incorporated medical, psychiatric and social supports saw a reduction in costs of $783 per member per month for high risk Medicaid members in the intervention group and an increase of $286 per member per month for participants with low needs (Solis-Roman & Knickman, 2017).

In order to justify the financing of integrated physical and behavioral health care models, integrated care interventions for individuals with SMI need to be evaluated to establish validity of the effectiveness in improving health outcomes and reducing healthcare costs and utilization for individuals with SMI. Studies of various integrated care models have shown a decrease in overall healthcare costs (Barnes, Murphy, Fowler, & Rempfer, 2012; Kim et al., 2013; Smith et al., 2011; Rhodes, et al, 2017; Solis-Roman & Knickman, 2017). In addition, integrated care providers need to be incentivized to drive positive outcomes through payment reform and pay for performance models (Millwee, Quinn & Goldfield, 2018; McGinty, et al, 2018).

Conclusion

The hypothesis for study is that there will be a more positive impact for individuals with SMI who are receiving the BHH intervention with or without primary care on their individual health care outcomes (i.e. body mass index, blood pressure); that there will be a more positive impact of the BHH with primary care than the BHH without primary care on individual's health outcomes; and, that there will be a significant decrease in healthcare cost and utilization for individuals with SMI in both BHH interventions than those that are in the TAU.

By combining the study of individual health outcomes with the Medicaid data of health care costs and utilization, this study provides a clearer picture of the projected costs benefits and the impact on health outcomes of integrated health care for individuals with SMI. The results of this study should provide insight into the effectiveness and efficiencies of the two comparative interventions and determine if there is a potential return on investment for

these services. The results of this study have the potential to assist in informing policy makers in their decisions about exploring or investing in these types of intervention models for integrating care for individuals with serious mental illness.

Chapter 2: Research Design and Methods

Design

This was a quasi-experimental longitudinal study comparing the health outcomes of individuals with SMI who received the BHH intervention with those who received the BHH & PC intervention, and it compared the healthcare utilization and costs of both BHH groups to one receiving Treatment as Usual (TAU).

Definition of Terms

- Seriously Mentally Ill (SMI): For the purpose of this study, individuals diagnosed with schizophrenia, schizoaffective disorder, a mood disorder, major depression or borderline personality disorder per the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (1994).

- Behavioral Health Home (BHH): For the purposes of this study, BHH was defined as incorporating components of care coordination, care management, health and wellness activities, family and individual support services, transitional services and coordination of support services that are provided in a behavioral health facility with the addition of appropriate primary care staff as defined in the Patient Protection and Affordable Care Act (2010).

- Behavioral Health Home & Primary Care (BHH-PC): For the purpose of this study, the BHH-PC was defined as a community behavioral health agency that provided the Behavioral Health Home services in addition to outpatient services such as intensive case management, outpatient care and partial care treatment and has added on site

either a primary care physician or APN to their agency services and licensed by the New Jersey Department of Health to provide primary health care services.

- Treatment As Usual (TAU): For the purposes of this study, the usual mental health treatment interventions were defined as intensive case management, outpatient treatment or partial care treatment with no specific effort at integrating health care.

Setting

The BHH and BHH-PC interventions were in community mental health settings licensed by the State of NJ as independent mental health clinics. The BHH-PC intervention is licensed by the NJ Department of Health to provide primary care services. All intervention sites were certified to provide the Behavioral Health Home service by the NJ Division of Mental Health and Addiction Services. The study included BHH intervention sites that were similar in the types of mental health service provided, size and budget, the population served and the service area population composition, but differed with regard to health care integration.

The BHH intervention without primary care was delivered at Catholic Charities Diocese of Trenton in Trenton NJ, Oakes Integrated Care in Trenton NJ and All Access Mental Health (AAMH) in Princeton, NJ. These providers offered services in a community mental health care setting and provided partial care, intensive case management and outpatient services. These agencies began receiving Medicaid reimbursement for BHH services in October 1, 2014 when CMS approved the BHH State Plan Amendment for Mercer

County, NJ. Catholic Charities had been operating an integrated care model for the five years prior to October 2014 with grant funding from SAMHSA which ended in September, 2014.

The Care Plus Center for Primary and Behavioral Health in Bergen County, NJ, served the study's population receiving Behavioral Health Home and Primary Care (BHH-PC) services. This agency offered services in a community mental health care setting and provided partial care, intensive case management, and outpatient. In addition, Care Plus was licensed by the NJ Department of Health to provide primary care services to individuals with behavioral health needs as well as the general population. This site had been operating an integrated care model for the five years prior to this study with grant funding from SAMHSA that ended in 2013 and began receiving Medicaid reimbursement as of July 1, 2014 for the BHH service that was approved by CMS.

The CMHCs in this study were similar in terms of the average size and nature of service provision of other CMHCs in the state. However, the fact that there were only a few CMHCs certified in New Jersey to provide the BHH service and were therefore eligible to participate in this evaluation, this study cannot make the claim that these CMHCs were representative of all CMHCs, even in the state of New Jersey.

Sample Size: Identification of Intervention and Control Groups

The initial BHH study population and comparison group were identified in claims over calendar years 2013-2016. To be eligible for the BHH group, recipients had to be age 18 or older with a diagnosis of severe mental illness (SMI) in the categories of schizophrenia and

mood disorders as identified in ICD 9 and ICD 10[1] (see Appendix A) and not be involved with the NJ Division of Children and Families' Children's System of Care (DCF-CSOC) and were not involved in a Program of Assertive Community Treatment (PACT) service. Medicare and Medicaid dual eligible beneficiaries were also excluded. Procedure codes that indicated a BHH recipients meeting these criteria were scanned for mental health services in a BHH to identify the intervention group, with the earliest qualifying claim marking their entry date. This group was further limited to only those receiving their BHH services at one of four providers: All Access Mental Health, Catholic Charities, Oaks Integrated Care, and CarePlus. Moreover, recipients had to have at least one day of Medicaid enrollment in the year prior to and after entry into the BHH. From the 493 age-eligible recipients with SMI and a qualifying BHH procedure code in the dataset, 419 went to one of the study providers, and 413 were Medicaid enrolled in the pre and post-BHH periods and thus, constituted our intervention population. Of these 413, 91 were categorized as BHH-PC since this intervention site at Care Plus provided onsite physical and behavioral health care. Dates of entry into BHH ranged from July 1, 2014 through December 31, 2016.

To identify the sampling frame for controls, recipients also had to be age 18 or older with a diagnosis of SMI, not covered by Medicare, and not involved with DCF-CSOC or a PACT team. They also had to reside in counties contiguous to Bergen and Mercer counties where the BHH providers in this study operate. Qualifying counties of residence were Passaic, Essex, Hudson, Hunterdon, Somerset, Middlesex, Monmouth, and Burlington

[1] ICD 10 was effective 10/1/2015. Therefore both diagnostic sets ICD 9 and ICD 10 were included since both were in effect during the span of the dates of the data set.

counties. Procedure codes on claims from calendar years 2013-2016 were then scanned to identify mental health services considered treatment as usual (TAU): partial care, partial hospitalization, acute partial hospitalization, or targeted case management. The earliest qualifying claim marked the entry date into TAU. A random sample of 2000 recipients meeting all these criteria was the initial sampling frame shared by Center for State Health Policy (CSHP). The universe of potential controls was further refined by requiring the latest allowable entry date to be December 31, 2015 since controls had to be in TAU for a two year period aligned with the pre- and post-intervention periods of the BHH intervention groups. The sampling frame was also limited to those having Medicaid enrollment in the two years following TAU entry. From the 2000 potential controls, 1567 entered TAU before December 31, 2015 and 1,417 of these had the requisite Medicaid enrollment and thus, constituted our final control group sampling frame.

While two of the interventions agencies have had SAMHSA integration grants in the past, the services provided in these grants differed from the services provided in the BHH in regard to the composition of the staffing and reporting requirements. The SAMHSA grantees did not have the requirements of staffing, the certification process or the quality measure reporting that is required as part of the State Plan Amendment with CMS. It is possible that participants in BHH, BHH with PC and TAU also participated in the SAMHSA integration grants and these individuals were not identifiable due to the fact that there was no prior billing or reporting requirements into the state under the federally funded grant.

Inclusion Criteria:

- Individuals age 18 and over

- Individuals with an SMI diagnosis, i.e. schizophrenia and mood disorders
- Individuals with Medicaid

Exclusion Criteria:

- Individuals in the Program of Assertive Community Treatment (PACT) due to ineligibility for the BHH service since it is seen as duplicative by CMS.
- Individuals in the NJ Children's System of Care since this BHH model is designed for adolescents and differs from the BHH interventions in this study.
- Individuals enrolled in both Medicaid and Medicare

Propensity Score Matching for Creation of Comparison Group

The intervention groups and the entire sampling frame of controls were compared on age, race, sex, baseline Medicaid enrollment, baseline healthcare utilization and total costs (Table 1). Chi-square tests were used for categorical variables and t-tests were used for continuous variables. Results show that on several variables, the intervention groups and sampling frame of controls differed significantly. Therefore, instead of randomly selecting a comparison group from the sampling frame, propensity score matching was used to select a comparison group of similar size and covariate distribution as the intervention group. This helps ensure that when comparing changes in these outcomes over time, as done in a difference-in-differences model (described below), the secular trends experienced by members of the comparison group approximate the trends experienced by members of the intervention groups as closely as possible.

Propensity scores are a commonly used tool in observational studies to reduce the effects of confounding caused by differences in baseline characteristics between treated and comparison subjects. A propensity score is the probability of being in the intervention group as a function of these baseline characteristics. A comparison group chosen with propensity

scores comparable to those of the treated group will have a similar distribution of measured baseline characteristics (Austin, 2011).

Table 1. Equivalency of intervention groups and sampling frame

Characteristics	Sampling Frame n=1417	BHH n=413		Just BHH n=322		BHH+PC n=91	
	Mean or %	Mean or %	p-value*	Mean or %	p-value*	Mean or %	p-value*
Age	39.3	**41.4**	**<0.01**	**41.1**	**0.01**	**42.3**	**0.02**
Male	48.7	45.0	0.19	44.7	0.20	46.2	0.64
Race							
Black	43.6	42.6	0.66	51.2	0.07	12.1	**<0.01**
White	39.0	39.0		33.5		58.2	
Hispanic	8.2	7.3		5.9		12.1	
Other	9.2	11.1		9.3		17.6	
Enrollment months	11.8	**11.5**	**<0.01**	**11.4**	**<0.01**	11.9	0.68
Baseline Utilization & Costs	Mean or %	Mean or %	p-value*	Mean or %	p-value*	Mean or %	p-value*
Inpatient (IP) Visits	0.6	0.6	0.87	0.5	0.13	1.0	0.07
Average IP LOS	2.3	2.8	0.18	2.2	0.67	**5.0**	**0.03**
ED Visits	2.7	**1.8**	**<0.01**	**1.7**	**<0.01**	2.3	0.46
BH Visits	66.3	58.2	0.12	58.1	0.16	58.6	0.40
PH Visits	13.1	11.4	0.08	11.3	0.07	11.8	0.42
E&M Visits	5.1	5.2	0.77	5	0.76	5.9	0.21
Total Costs (IP+BH+PH+ED)	$13,908	**$11,248**	**<0.01**	**$9,359**	**<0.01**	$17,933	0.07

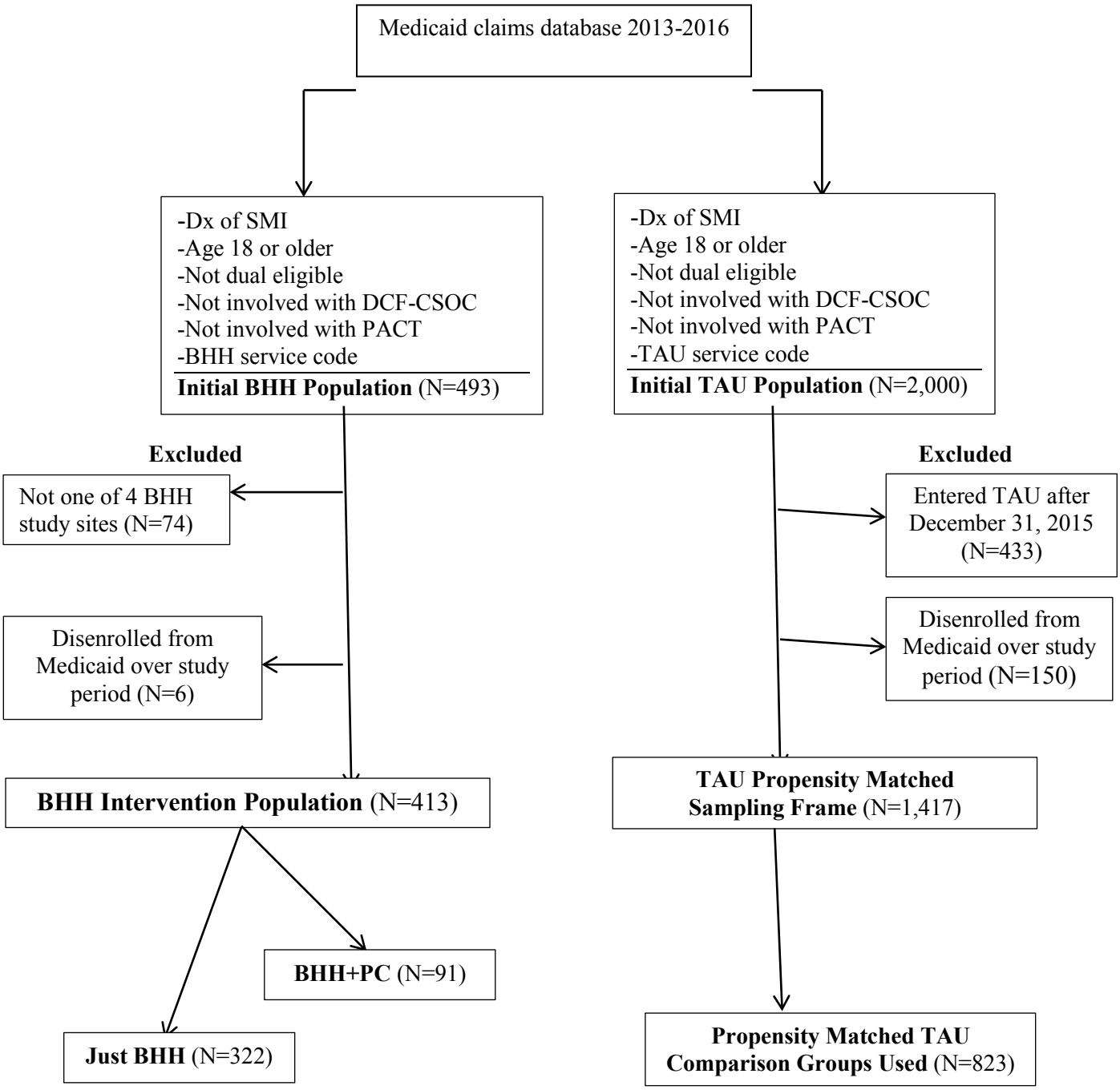
*p-value from t-test for continuous variables (age, enrollment months, baseline healthcare utilization and costs); from chi-square test for categorical variables (race and gender)

For each intervention group and the full sampling frame of controls, propensity scoring was calculated using Stata's --psmatch2-- function predicting inclusion in the intervention group as a function of race/ethnicity, sex, months of enrollment in the baseline period, and the baseline year (since individuals entered the BHH and TAU cohorts at different

times over the study period).[2] Age was only used in the propensity score estimation for the BHH+PC group, but not used in the estimation for the BHH overall and BHH alone intervention groups because doing so often increased imbalances by race/ethnicity more than the age balance was improved by inclusion. Overlap in the range of propensity scores was ensured between the intervention and control observations by using the "common support" option and any observations outside the region of common support were discarded. After creating a balanced score, one can set a variety of parameters in --psmatch2-- to match each individual subject in the intervention with one or more comparison individuals having a similar propensity score. Nearest neighbor matching was specified without replacement and a caliper width equal to 0.2 of the standard deviation of the logit of the propensity score, which has been suggested as optimal (Austin, 2010). In this specification, a control individual having the closest propensity score to the BHH individual and not already matched to another BHH individual was selected. The caliper was the maximum absolute difference in the propensity scores between a BHH individual and its matched control. The use of only one matched control ensured an equal sized comparison group, thereby reducing the likelihood of violating the equal variances assumption and protecting the integrity of the significance testing in multiple regression analyses. Illustration 2 is a visual depiction of the process to select the sample for this study.

[2] Because a difference-in-differences framework was used for the multiple regression analysis (described later), the BHH and control groups do not have to have similar baseline levels of the outcomes. Moreover, matching the intervention to control group on baseline levels of the outcome can be problematic (Daw & Hatfield, 2018). Therefore, these variables were not used in our propensity matching algorithm.

Illustration 2: Sample Selection Flow Chart



After selecting the matched control group for each intervention group, evaluation occurred on how well the intervention and comparison groups were balanced. The practice of using hypothesis testing to evaluate balance is not recommended for several reasons (Imai, King & Stuart, 2007; Austin, 2011). Briefly, the change in sample size between the full sampling frame and selected controls affects power and tests of significance and also, balance is a property of the sample at hand and reference to an external superpopulation is not appropriate. Instead, the standardized mean difference was calculated between covariates in the unmatched and matched samples using Stata's –pbalchk-- function (Garrido, 2014). The standardized difference is the difference in the means divided by a pooled estimate of the standard deviation of the covariate. Although there is no rule on the maximum acceptable imbalance in propensity score matching, standardized differences between 10% and 25% have been proposed (Garrido, 2014).

Table 2 shows the results of this test of equivalency between each intervention group and the comparison group. Absolute values of standardized differences of greater than .1 suggests differences between groups. Most variables analyzed were below this threshold, with the exception of age, race/ethnicity, and time enrolled for some of the group comparisons, which raises the possibility of biasing these findings. To avoid possible bias, these variables were controlled for in the outcome analysis. The propensity matched comparison group was more similar to the intervention groups than the entire sampling frame on most characteristics. The size of the final propensity matched TAU was 823 selected randomly from the total comparison group of 1,417, leaving the remainder of 594 unused in this study.

Table 2. Standardized differences in covariates between intervention groups and matched controls

	BHH vs. TAU			Just BHH vs. TAU			BHH+PC vs. TAU		
Variable	Mean Treated	Mean Control	Standardized Difference	Mean Treated	Mean Control	Standardized Difference	Mean Treated	Mean Control	Standardized Difference
Age	41.37	38.49	0.240	41.06	38.44	0.218	42.30	41.23	0.090
Male	45.0%	45.0%	0.005	45.0%	44.0%	0.013	46.0%	46.0%	0.000
Black	43.0%	44.0%	-0.020	51.0%	52.0%	-0.019	12.0%	12.0%	0.000
White	39.0%	39.0%	-0.005	33.0%	34.0%	-0.020	58.0%	60.0%	-0.045
Hispanic	7.0%	7.0%	0.009	6.0%	5.0%	0.025	12.0%	15.0%	-0.109
Other	11.0%	10.0%	0.041	9.0%	8.0%	0.055	18.0%	11.0%	0.195
Enrollment months	11.52	11.75	-0.132	11.49	11.59	-0.056	11.90	12.18	-0.210

Study Interventions:

BHH Intervention

The BHH intervention in this study was a coordinated care model that consisted of various clinical and non-clinical interfaces for individuals with SMI that included self-management support, delivery system design, care management, decision support, clinical information systems and community linkages (SAMHSA-HRSA, May 2012). These BHH services were provided by a team that included nurses, social workers and peer wellness coaches and the team that could have included dieticians, pharmacists or other health care professionals as needed. Individuals in the BHH service were not eligible for intensive case

management services. The BHH intervention implemented in NJ included three levels of BHH intervention: engagement, active and maintenance.

During the engagement process, the following BHH intervention occurred:

- Initial contact with the client was established in the participant's home, medical or psychiatric inpatient unit or the BHH agency after a self or other treatment provider referral was made.
- The client was informed of the BHH program and encouraged to agree to the service.
- If the client agreed to services than an initial appointment was scheduled.

During the active phase, the following interventions occurred:

- At the first 2-3 appointments with BHH team:
    - Diagnosed for physical and behavioral health condition was established
    - Comprehensive person-centered treatment plan was initiated.
    - Initiated self-management tools
    - Began physical and behavioral health education relevant to identified needs

    - Medical screens included, but were not limited to, glucose and lipid levels, blood pressure, weight, body mass index, hepatitis C and HIV
    - Began case management activities to link participant with needed medical and other community services

- After initial assessment, participants continued in the active phase and received:
    - Ongoing care management
    - Monitoring of physical and behavioral health needs
    - Continued evaluation of person centered treatment plan was continually updated in order to meet changing goals
    - If needed, assistance with meeting personal goals i.e. going to a doctor's appointment, learning a bus line to get to appointments, signing up for gym membership
    - Physical and behavioral health treatment

Once a participant in the BHH met their personal goals and was no longer in need of frequent monitoring of physical or behavioral health needs, they were considered to be in the maintenance phase of the BHH intervention that required contact with the BHH at a minimum of one time in each quarter of the year. Services during this phase included:

- Support to meet medical and behavioral needs
- Assistance with community linkage

- Revision of personal care plans
- Physical and behavioral health treatment

Participants were expected to be in the BHH intervention for as long as they needed the service. It is not a time limited service and individuals flowed between the active and maintenance phases as clinically indicated. The intent of the BHH was that it became the primary source of physical and behavioral health coordination for individuals with SMI.

Behavioral Health Home and Primary Care Intervention

The behavioral health home and primary care (BHH-PC) intervention was a combination of the behavioral health home and traditional services provided in a community mental health center with the addition of the service of a primary care physician to treat the health needs of the agency's members. The participants in the BHH-PC intervention group may have been enrolled in partial care, intensive case management or outpatient services and also received their primary care services at the behavioral health provider agency as part of the intervention. To enter into the BHH-PC service, participants were admitted by self-referral, or referral from another community agency or psychiatric inpatient unit.

Services included in the BHH-PC center were:

- BHH services
- Health education
- Annual physicals
- Referral and linkage to other healthcare providers
- Ongoing monitoring of physical health issues
- One electronic heath record and joint treatment plan for their physical and behavioral health goals

The BHH-PC was not a time limited intervention. Continuation in the BHH-PC services was voluntary. An individual may have chosen to keep their primary care services at the BHH-PC even after they have completed or concluded their behavioral health services at the agency.

Treatment as Usual (TAU) Intervention

The participants in the TAU group received integrated case management (ICMS), partial care and/or traditional outpatient treatment. To enter into these services, participants were admitted by self-referral or referral from another community agency or psychiatric inpatient hospital. Continuation in these services was voluntary.

ICMS services provided coordination of community support services and assisted with linkages for individuals with SMI. The ICMS service was a time limited service of 12 months and eligibility was prioritized for individuals who were leaving state psychiatric hospitals. Individuals in ICMS could not be in the BHH service since CMS sees these services as duplicative. Individuals in the BHH were not eligible for the ICMS program.

The partial care service was a day program designed for individuals with mental illness. The partial care day program consisted of various group therapies, individual therapy and medication monitoring. There was no time limit on this service but it was subject to medical necessity criteria and utilization review. Typically, an individual was in partial care three to five days per week with a maximum of five hours per day.

The traditional outpatient service included individual, group and family therapy, and psychiatric evaluation and medication monitoring services. This service was not time limited but was subject to medical necessity criteria and utilization review.

Training on Intervention

The New Jersey Division of Mental Health and Addiction Services (DMHAS) had retained The National Council to establish a learning collaborative for agencies interested in becoming behavioral health homes in Bergen and Mercer Counties in NJ. The National Council trained the agencies in Bergen and Mercer Counties that were implementing the BHH intervention in collaboration with existing grant funded models in NJ. The National Council also developed a training program for initial and ongoing training of BHH staff. Once this was established, staff involved in this study were trained through the National Council modules.

There is not an established training manual of the BHH and BHH & PC intervention. However, professionals involved in the BHH and BHH & PC were required to meet the qualifications listed in the next section.

Qualifications of Interventionists

The BHH and BHH-PC interventionists in this study were nurses, social workers and peer wellness coaches. The interventionists at the TAU could have also been social workers, nurses, mental health counselors and possibly peer wellness coaches.

The nurses in the BHH and BHH-PC intervention were Advance Practice Nurses (APN), Registered Nurses (RN) or Licensed Practical Nurses (LPN) and all were licensed through the NJ Division of Consumer Affairs. An APN working as a primary care practitioner was supervised by a physician. The nurses were expected to have 1-2 years' experience working with individuals with mental illness and Psychiatric Nurse Specialist Certification is preferred.

The social workers and/or mental health counselors in the BHH, BHH-PC and TAU interventions had a Masters or Bachelors in Social Work (MSW or BSW) degree or other mental health counseling degree. In order to supervise other clinicians, the supervising clinician were licensed as a Licensed Clinical Social Worker (LCSW), licensed Psychologist or other licensed mental health professional through the New Jersey Division of Consumer Affairs.

The peer wellness coaches in the BHH and BHH-PC interventions were individuals who have lived experience with a mental illness and have completed the Certified Peer Wellness Coach training through Rutgers University School of Health Related Professions. Certification for this program was provided through the NJ Division of Mental Health and Addiction Services. Other interventions may have employed a Peer Wellness Coach but certification was not required in these interventions.

A physician providing primary care services in a behavioral health care setting were NJ board certified with a license through NJ Division of Consumer Affairs. This physician

had experience working with individuals with SMI and/or individuals with other chronic health issues.

Fidelity Assessment

The NJ Department of Human Services, Division of Mental Health and Addiction Services provided the initial and annual certification of the BHH intervention sites. Within two years of initial certification, the expectation was that the BHHs obtain accreditation as a BHH through a nationally recognized accreditation organization such as the National Committee for Quality Assurance (NCQA) or Joint Commission. Through the completion of this study, the BHH and BHH with PC intervention sites did not exceed the initial two-year certification and therefore, they were provided certification of the BHH intervention by the state.

The Division of Mental Health and Addiction Services (DMHAS) certified the BHH intervention sites by using a standardized tool named the "New Jersey Health Home Provisional Certification Checklist" provided in Appendix B (Carrick, et al., 2014). The evaluators from the state went to the BHH site and toured the facility, met and interviewed the BHH team and went through the certification checklist. Areas that were reviewed in the checklist were Implementation, Staffing/Recruitment/Training, Services, Support Services and health information technology. On the checklist, BHH sites were required to meet the bolded items in year one and the remaining items by the end of year two. If the agency did not meet the minimum requirements in a review, they were given the opportunity to provide

missing documents but they were not given certification until the requirements were satisfied. If after the one-year renewal a BHH did not meet the requirements, the BHH was given 15 days to submit a plan of correction. During this study period, the BHH and BHH with PC interventions site met these requirements.

Data

Data for this analysis came from two sources: 1) NJ Medicaid beneficiary, fee-for-service claims, and managed care encounter data from a limited dataset that the Division of Medical Assistances and Health Services (DMAHS) provided to the Center for State Health Policy (CSHP), and; 2) Electronic Health Record (EHR) data from Behavioral Health Home sites reported to the NJ Division of Mental Health and Addiction Services to DMAHS. All data preparation and analyses were done using SAS Enterprise Guide 7.1 and Stata 15. The BHH data sets were provided through a Memorandum of Understating and Data Use Agreement (see Appendix C) granting the CSHP permission from DMHAS to release the data for this study.

Measures

Health Outcomes

Electronic Health Record (EHR) data from Behavioral Health Home sites was reported by the NJ Division of Mental Health and Addiction Services for 2014-2016. The study included two datasets, one with BMI measurements and another with blood pressure readings. Records were restricted to only those individuals receiving their BHH services at

one of the four providers in this study: All Access Mental Health, Catholic Charities, Oaks Integrated Care, and CarePlus. Furthermore, because no control group was available for analysis of health outcomes, the analytic sample was restricted to only those individuals with at least two BHH visits where BMI or BP was measured so outcomes could be compared for the two intervention groups over time. The final analytic sample for the BMI outcomes was 213 in the overall BHH intervention population. Of these 213, 100 were categorized as BHH-PC. For the blood pressure outcomes, the corresponding numbers were 224 in the BHH and 100 in BHH-PC group.

The original study had proposed to also measure the clinical depression screening (PQH9) values and the occurrence of a care transition plan after inpatient hospitalization. However, there was not sufficient data on these variables in the data sets provided to do analysis that would be statistically valid.

Four health outcomes were calculated from the EHR data: continuous BMI (in kg/m^2), BMI category [Not overweight (BMI <25 kg/ m^2)[3], Overweight (BMI 25 - <30 kg/ m^2), and Obese (BMI >=30kg/ m^2)], Systolic BP (in mm Hg), and Diastolic BP (in mm Hg).

An indicator for the 30-day Follow-up after Hospitalization for Mental Illness health outcome metric was also provided by CSHP on the 2013-2017 claims dataset for the intervention population. This indicator was based on HEDIS specifications and determines whether a visit with a mental health practitioner occurred within 30 days of discharge after hospitalization for mental illness. The measure was modified to count visits to the BHH as a

[3] Sample size was insufficient to create a separate group for those underweight (BMI <18.5 kg/m^2).

qualifying follow-up mental health visit. Unlike the healthcare cost and utilization measures and the health outcome metrics from EHRs (described below), which all use the person as the unit of analysis, the unit of analysis for this metric was at discharge summary of each hospitalization, since follow-up was measured after each qualifying mental illness hospitalization. This measure was summarized for each individual in the intervention group with a qualifying mental illness hospitalization for the year prior to BHH entry and/or in the year following BHH entry.[4] Analysis for this health outcome metric is discussed below in the section on outcome metrics from EHR.

Healthcare Costs and Utilization

Ten measures of health care cost and utilization were calculated from Medicaid claims data provided by CSHP for the intervention population and sampling frame of controls: number of inpatient hospitalizations, average number of days per inpatient hospitalization, inpatient hospitalization costs, number of emergency department (ED) visits, ED visit costs, number of outpatient behavioral health (BH) visits, BH visit costs, number of outpatient physical health (PH) visits, PH visit costs, and total combined cost of inpatient, outpatient, and ED utilization. An alternative specification of PH visits and costs, identifying only visits for Evaluation & Management (E&M), was also calculated. Illustration 3 contains further details on the preparation of these measures. These measures were calculated for each individual in the intervention group for the year prior to BHH entry and the year following

[4] Not all Individuals in the BHH had qualifying hospitalizations, nor did they necessarily have a qualifying hospitalization in both the pre and post measurement periods, so the analysis sample differed by intervention group (BHH, BHH-PC, etc.) and measurement period (see Table 3).

BHH entry. For the TAU group, they were calculated for the first year and second years in TAU. All costs were inflation-adjusted to 2017 dollars using the Consumer Price Index for Medical Care.

Illustration 3: Healthcare Costs and Utilization Measures and Codes

Inpatient utilization and associated costs was identified using claims with Claim Type=1 (Inpatient Hospital) in the Medicaid claims and encounter database. Only admissions to general acute care hospitals (Provider Type=60) were included. Inpatient utilization was based on date of discharges. Duplicate claims were deleted, and multiple, contiguous claims for a continuous visit were consolidated into a single visit; however, payment information on all claims associated with a visit was counted in determining inpatient costs.
Average inpatient length of stay was the total number of inpatient days for each Medicaid recipient divided by the total number of visits. Inpatient visit days were calculated using admission and discharge dates on inpatient claims. If there were multiple claims for a visit due to transfers between hospitals or interim billings, the earliest admission date and latest discharge date were used to calculate the number of inpatient days.
Emergency department (ED) utilization and associated costs were identified using claims with Claim Type=3 (Outpatient Hospital) in the Medicaid claims and encounter database. Only visits to the emergency department of general acute care hospitals (Provider Type=60) were included. ED visits were identified among outpatient claims using uniform billing revenue codes 450-459. Multiple ED visits claims for the same person at the same provider on the same date of service were counted as one visit; however, payment information on all claims associated with a visit was counted in determining ED costs.

Behavioral health (BH) outpatient visits and associated costs were determined by claim type and provider specialty in conjunction with place of service and service procedure codes. Physician, Independent Clinic, Psychologist, and Mid-level Practitioner claim types were included. Claims with the following provider specialty types were included: Psychiatry (260), Nurse Practitioner Psychiatric Mental Health (262), Psychiatry/Neurology (270), Psychologist (610), Licensed Clinical Social Worker (611), Adult Mental Health Rehab (722), Adult Clinic Case Management (819), CSS-DMAHS (821), PACTS (908), Independent Clinic – Drug/Alcohol (920), and Independent Clinic – Mental Health (940). Visits with Place of Service=0 (Emergency Room) or 3 (Inpatient Hospital) were excluded. Claims for substance use treatment-related visits with service procedure codes H0015, H0020, H0033, H0010, H0018 were also excluded, as were claims for transportation (Z0330, A0425) to such visits. Claims for the same provider on the same day were counted as a single visit; however, payment information on all claims associated with a visit was counted in determining BH visit costs.

Physical health (PH) outpatient visits and associated costs were determined using two methods.

Method #1 (PH visits) The first method counted all outpatient visits not considered behavioral health care visits (as defined above). Visits with Place of Service=0 (Emergency Room) or 3 (Inpatient Hospital) were still excluded. Claims for the same provider on the same day were counted as a single visit; however, payment information on all claims associated with a visit was counted in determining PH visit costs.

Method #2 (E&M visits) The second method identified a subset of physical health visits using CPT codes indicating a visit for Evaluation & Management in conjunction with place of service and provider specialty codes as follows:

- Place of service: Doctors office, Skilled Nursing Home, Outpatient Hospital, Clinic; Visits with Place of Service=0 (Emergency Room) or 3 (Inpatient Hospital) were still excluded.
- Provider must be Physician, Independent Clinic, FQHC, Hospital, Advance Practice Nurse/Mid-level, Nurse-midwife
- Visit must have a CPT code in this set: 99201,99202,99203,99204,99205,99206,99207,99208,99209,99210,99211,99212, 99213,99214,99215,99241,99242,99243,99244,99245,99381,99382,99383,99384,99385,99386, 99387,99388,99389,99390,99391,99392,99393,99394,99395,99396,99397,99401,99402,99403, 99404,99406,99407,99408,99409,99411,99412,99420,99429,99455,99456

Claims for the same provider on the same day were counted as a single visit.

Control variables available in Medicaid claims data were number of enrollment days in the calendar year and the demographics age, sex, and race. Race was categorized into White, Black, Hispanic, and Other.

Analysis of Health Outcomes

This study first compared each outcome between individuals with only one measurement and those with at least two measurements to determine if individuals excluded from the analytic sample were different with regards to the outcome measures. The mean of the first recorded BMI, systolic, and diastolic BP were compared between these two populations using t-tests. The categorical BMI variable was compared using a chi-square test. Next, for each outcome, the first available measurement for each individual in the analytic sample was compared to their second available measurement. If more than two measurements were available, the second measurement was preferentially chosen to be at least six months after the first, when such data was available. BMI, systolic, and diastolic BP were all compared within the intervention groups using paired t-tests. The categorical BMI variable was compared using the Wilcoxon signed rank test which accounts for the paired nature of the data. To compare these health outcomes between the BHH-PC enrollees and those enrolled in the BHH sites without integrated primary care, the mean of the differences between the two BMI, systolic, and diastolic BP measurements for these intervention groups was compared using t-tests. Significance was set at $p \leq 0.05$.

The 30-day Follow-up after Hospitalization for Mental Illness rate (described in an earlier section) was compared from the pre to the post-BHH enrollment period using univariate linear regression. This specification allowed for a comparison of means with an adjustment due to the fact that some members of the intervention group had repeated

measurements (if they had more than one qualifying mental illness hospitalization). Significance was also set for this analysis at $p \leq 0.05$.

Analysis of Health Care Coasts and Utilization Outcomes

A difference-in-differences (DD) design was used to isolate the effect of BHH participation on all the healthcare cost and utilization outcomes calculated from Medicaid claims data. In DD, the effect of the intervention is calculated as a relative change in outcomes between individuals in the intervention and the comparision group from the pre to the post-intervention period. Because outcomes were assessed for all individuals in both the pre and post-intervention period, there was balanced panel data that modeled the differenced outcome as our dependent variable (An, 2016). To control for any residual imbalances in matching variables between the intervention and comparison group, age, race/ethnicity, sex, and enrollment months in the baseline year were included in multiple regression models. We also controlled for months of enrollment in the post year and year fixed effects. Robust standard errors were used to account for any clustering by BH provider where individuals sought care, which could be variable in the TAU group. Significance was set at $p \leq 0.05$.

Finally, because the healthcare utilization and cost outcomes could be calculated for all identified BHH enrollees in the Medicaid administrative database, regardless of whether the person continued to visit the BHH, this analysis was able to follow an intention-to-treat (ITT) design. This approach conservatively estimates effects by treating all individuals who

enter the intervention group as members of the intervention group for the duration of the follow-up period, even if they drop out of the intervention.

Human Subjects:

Data collected that was given to a statistician consultant for analysis was encrypted, password protected and de-identified. The statistician and principal investigator completed the CITI-Protection of Human Subjects Research Training courses to fulfill the University's requirement for training in human research protections.

While there was no direct benefit for the individuals who participated in this study, there was great importance that individuals who participated in this study were contributing to research that may help others who also have SMI. The benefit to society was that if the BHH and/or BHH-PC interventions were more effective in improving health outcomes and decreasing overall healthcare utilization and costs than those in the TAU, then the benefit to the individuals with SMI will be improved in terms of healthcare outcomes and greater life expectancy.

The risks of this study to the participant was that there could be the possibility of health information being compromised, despite all efforts to protect it. In order to protect study participant's privacy, any electronic correspondence of information was encrypted and de identified with security protections and passwords. Information from NJ MMIS was de-identified in accordance with the Health Insurance Protection and Portability Act (HIPPA) when it was made available to the principal investigator after a linkage had been made between a study participant's health outcomes and NJMMIS healthcare costs and utilization.

However, if there had been a breach in confidentiality, individuals and providers participating in this study would have been informed.

CHAPTER 3: RESULTS

Health Outcomes

The first question this study sought to answer was: To what extent do the BHH and the BHH with Primary care intervention models have an impact on the health outcomes (i.e. body mass index, blood pressure) of individuals with SMI in the BHH interventions?

BHH enrollees with only one BMI measurement (n=346) had an average BMI of 32.1 kg/m^2. BHH enrollees with at least two BMI measurements (n=213) had an average BMI of 32.0 kg/m^2. This difference was not statistically significant. Enrollees with only one BP measurement (n=350) had an average systolic BP 124.4 mmHg and an average diastolic BP of 78.7 mmHg. Enrollees with at least two BP measurements (n=224) had an average systolic BP of 126.7 mmHg and an average diastolic BP of 79.6 mmHg. Neither of these measurements were statistically significant. The categorical distribution of BMI also did not differ statistically between individuals dropped and retained for analysis (data not shown). There is a discrepancy of the N for the individuals in the health outcome measure versus those in the utilization and cost outcome measure due to the fact that more BHH with PC and less BHH participants had eligible data for BP and BMI. Results for health outcomes from analysis of EHR data for BHH enrollees with at least two measurements are shown in Table 3.

Table 3

Table 3. Comparison of BHH enrollees' health outcomes over time										
	BHH					Just BHH				
	1st		2nd		p-value*	1st		2nd		p-value*
	% or Mean	SE	% or Mean	SE		% or Mean	SE	% or Mean	SE	
	n=213					n=113				
BMI	32.0	0.55	32.4	0.54	0.19	32.4	0.80	32.6	0.75	0.63
BMI Category					0.29					0.36
Not Overweight	22.1%	2.8	17.4%	2.6		22.1%	3.92	17.7%	3.60	
Overweight	20.2%	2.8	26.3%	3.0		23.0%	3.98	27.4%	4.21	
Obese	57.7%	3.4	56.3%	3.4		54.9%	4.70	54.9%	4.70	
	n=224					n=124				
Systolic BP	126.7	1.0	131.5	5.48	0.38	127.5	1.52	127.4	1.35	0.97
Diastolic BP	79.6	0.8	80.9	0.64	0.11	78.2	1.11	80.5	0.89	0.06
Above 140/90	6.7%	0.02	4.9%	0.01	--	7.3%	0.02	5.6%	0.02	--
Notes: "--" indicates statistical testing could not be conducted due to expected cell counts <5.										
*p-value from paired t-tests for continuous variables and Wilcoxon sign rank test for BMI category.										

Table 3. Comparison of BHH enrollees' health outcomes over time					
	BHH+PC				
	1st		2nd		p-value*
	% or Mean	SE	% or Mean	SE	
	n=100				
BMI	31.6	0.76	32.2	0.78	0.19
BMI Category					0.63
Not Overweight	22.0%	4.16	17.0%	3.78	
Overweight	17.0%	3.78	25.0%	4.35	
Obese	61.0%	4.90	58.0%	4.96	
	n=100				
Systolic BP	125.6	1.39	136.5	12.16	0.37
Diastolic BP	81.2	0.96	81.4	0.91	0.86
Above 140/90	6.0%	0.02	4.0%	0.02	--
Notes: "--" indicates statistical testing could not be conducted due to expected cell counts <5.					
*p-value from paired t-tests for continuous variables and Wilcoxon sign rank test for BMI category.					

Health outcomes for BHH and BHH with PC

On average, there was 11.5 months between the two BMI measurements (Interquartile range {IQR}: 9.3-13.3 months) and 11.8 months (IQR: 9.3-13.5 months) between the two blood pressure readings (data not shown). Statistical testing showed no significant differences in BMI or blood pressure over this time period. There was also no significant difference in rates of 30-day follow-up after mental illness hospitalization in the first year after BHH enrollment compared to the year prior to enrollment (see Table 4).

Table 4: **Comparison of Rates of 30 Day Follow-up After Hospitalization for Mental Illness among BHH Enrollees**

	1 Year Pre-BHH			1 Year Post-BHH			p-value*
Treatment Group	n	%	SE	n	%	SE	
BHH	86	82.6%	0.04	60	76.7%	0.06	0.40
Just BHH	55	85.5%	0.05	38	84.2%	0.06	0.87
BHH+PC	31	77.4%	0.08	22	63.6%	0.11	0.31

*p-value from univariate regression of follow-up rate on post indicator, adjusting for repeated measurements on a single individual

Point estimates for the overall group of BHH enrollees show:

- BMI went from 32.0 to 32.4 kg/m^2.
- The percentage of BHH enrollees not considered overweight decreased from 22.1% to 17.4%.
- Systolic blood pressure increased from 126.7 to 131.5 mm Hg.
- Diastolic blood pressure increased from 79.6 to 80.9 mm Hg.
- Rates of 30-day follow-up after mental illness hospitalizations decreased from 82.6% to 76.7%.

The second question this study sought to answer: Is the BHH with Primary Care intervention more effective than a BHH that has not added Primary Care in improving the health outcomes of individuals with SMI?

Table 5. Comparison of BHH versus BHH+PC enrollees' health outcomes over time

	Just BHH			BHH+PC			BHH vs. BHH+PC	
	N	Mean Difference between 1st and 2nd Measurements	SE	N	Mean Difference between 1st and 2nd Measurements	SE	Difference in Differences	p-value*
BMI	113	0.2	0.3	100	0.6	0.5	-0.4	0.4
Systolic BP	124	-0.1	1.5	100	10.9	12.0	-10.9	0.4
Diastolic BP	124	2.3	1.2	100	0.2	1.2	2.1	0.2

*p-value from t-tests

BHH+PC

On average, there was 11.2 months between the two BMI measurements (IQR: 10.9-12.7 months) and 11.4 months (IQR: 11.0-12.8 months) between the two blood pressure readings (data not shown). Statistical testing showed no significant differences in BMI or blood pressure over this time period. There was also no significant difference in rates of 30-day follow-up after psychiatric hospitalization in the first year after BHH enrollment compared to the year prior to enrollment.

Point estimates for the group of BHH+PC enrollees showed no statistical significance:

- BMI went from 31.6 to 32.2 kg/m^2.

- The percentage of BHH-PC enrollees not considered overweight decreased from 22.0% to 17.0%.
- The percentage of BHH-PC enrollees considered overweight increased from 17.0% to 25.0%.
- The percentage of BHH-PC enrollees considered obese decreased from 61.0% to 58.0%.
- Systolic blood pressure increased from 125.6 to 136.5 mm Hg.
- Diastolic blood pressure increased from 81.2 to 81.4 mm Hg.
- Rates of 30-day follow-up after mental illness hospitalizations decreased from 77.4% to 63.6%.

BHH Alone

On average, there was 11.8 months between the two BMI measurements (IQR: 8.4-14.5 months) and 12.1 months (IQR: 8.1-14.7 months) between the two blood pressure readings (data not shown). Paired t-test shows that over time in the BHH intervention group without integrated primary care:

- Diastolic blood pressure increased from 78.2 to 80.5 mm Hg. This effect was marginally statistically significant (p=0.06)

Statistical testing showed no other significant differences in BMI or blood pressure over this time period. There was also no significant difference in rates of 30-day follow-up after psychiatric hospitalization in the first year after BHH enrollment compared to the year prior to enrollment.

Point estimates for the group of BHH enrollees without integrated primary care showed no statistical significance:

- BMI went from 32.4 to 32.6 kg/m^2.
- The percentage of BHH enrollees not considered overweight decreased from 22.1% to 17.7%.
- The percentage of BHH enrollees considered overweight increased from 23.0% to 27.4%.
- Systolic blood pressure decreased from 127.5 to 127.4 mm Hg.
- Rates of 30-day follow-up after mental illness hospitalizations decreased from 85.5% to 84.2%.

BHH+PC vs. BHH

The changes over time in the BMI and blood pressure of the BHH-PC intervention group did not differ significantly from the changes in the group in the BHH without integrated primary care (see Table 5). As shown previously in Table 4, there are no statistically significant differences in follow up after hospitalization of the two intervention groups.

Costs and Utilization

The third question this study sought to answer was: Do individuals with SMI in the BHH integrated care interventions have a greater reduction in healthcare costs and utilization than individuals with SMI receiving TAU?

Results for healthcare cost in Table 6 and utilization outcomes are shown in Table 7.

Table 6: Results of difference-in-differences regressions modeling impact of BHH and BHH+PC on healthcare cost outcomes

Costs	BHH (n=413) vs. TAU (n=413)			Just BHH (n=319)* vs. TAU (n=319)		
Total (IP+BH+PH+ED)	**$2,562**	**$915**	**<0.01**	**$3,052**	**$987**	**<0.01**
IP	-$1,087	$702	0.12	-$1,299	$721	0.07
ED	$142	$99	0.15	$191	$117	0.10
BH	**$3,682**	**$563**	**<0.01**	**$4,340**	**$643**	**<0.01**
PH	-$175	$179	0.33	-$179	$230	0.44
E&M	$33	$24	0.17	$50	$27	0.06

*Three individuals in Just BHH group were off region of common support in propensity matching and thus dropped.

Costs	BHH+PC (n=91) vs. TAU (n=91)			BHH+PC (n=90)** vs. BHH (n=90)		
Total (IP+BH+PH+ED)	$429	$1,819	0.81	-$1,343	$1,961	0.49
IP	-$2,131	$1,619	0.19	-$27	$1,553	0.99
ED	-$313	$204	0.13	-$176	$172	0.31
BH	**$3,054**	**$862**	**<0.01**	-$1,112	$1,096	0.31
PH	-$181	$207	0.39	-$28	$223	0.90
E&M	-$10	$55	0.85	-$61	$64	0.34

**One individual in BHH+PC was off region of common support in propensity matching and was thus dropped.

Table 7: Results of difference-in-differences regressions modeling impact of BHH and BHH+PC on healthcare utilization outcomes

Utilization	BHH (n=413) vs. TAU (n=413)			Just BHH (n=319)* vs. TAU (n=319)		
	β	SE	p-value	β	SE	p-value
Inpatient (IP) Visits	-0.18	0.10	0.05	-0.16	0.10	0.10
Average IP LOS	-0.27	0.49	0.58	-0.09	0.49	0.86
ED Visits	0.31	0.24	0.19	0.54	0.29	0.06
BH Visits	**24.79**	**3.99**	**<0.01**	**29.07**	**4.88**	**<0.01**
PH Visits	**-2.70**	**1.23**	**0.03**	-2.36	1.54	0.13
E&M Visits	0.12	0.35	0.74	0.54	0.40	0.18

Table 7: Results of difference-in-differences regressions modeling impact of BHH and BHH+PC on healthcare utilization outcomes (continued)

	BHH+PC (n=91) vs. TAU (n=91)			BHH+PC (n=90)** vs. BHH (n=90)		
Utilization	β	SE	p-value	β	SE	p-value
Inpatient (IP) Visits	-0.45	0.26	0.08	-0.08	0.24	0.75
Average IP LOS	-1.44	1.58	0.36	-1.28	1.48	0.39
ED Visits	**-1.04**	**0.50**	**0.04**	-0.86	0.46	0.06
BH Visits	**16.31**	**5.21**	**<0.01**	-7.84	8.29	0.35
PH Visits	-3.85	2.21	0.08	-1.96	2.06	0.34
E&M Visits	-0.24	0.81	0.77	-1.17	0.94	0.21

**One individual in BHH+PC was off region of common support in propensity matching and was thus dropped.

BHH with PC and BHH versus TAU

Regression models indicate that, compared to TAU, the first year of enrollment in a BHH resulted in:

- 18 fewer inpatient hospitalizations per 100 persons. This effect was marginally statistically significant (p=0.05).
- 25 more behavioral health visits per person. This effect was statistically significant (p<0.01).
- 2.7 fewer physical health related visits per person. This effect was statistically significant (p=0.03)
- Increased total costs per person of $2,562. This effect was statistically significant (p<0.01).
- Increased behavioral health costs of $3,682 per person. This effect was statistically significant (p<0.01)

No other measures of utilization or cost were statistically significant, but point estimates were as follows:

- Average length of inpatient hospital stay per person decreased by just over 1/4 day (0.27).
- 31 more ED visits per 100 persons.
- 12 more Evaluation and Management (E&M) visits per 100 persons.
- $1,087 less per person for inpatient hospitalizations.
- $142 more per person for ED visits.
- $175 less per person for physical health-related visits.

BHH Alone versus TAU

Regression models indicate that, compared to TAU, the first year of enrollment in a BHH without integrated primary care resulted in:

- 29 more behavioral health visits per person. This effect was statistically significant ($p<0.01$).
- 54 more ED visits per 100 persons. This effect was marginally statistically significant ($p=0.06$).
- Increased total costs per person of $3,052. This effect was statistically significant ($p<0.01$).
- $1,299 less per person for inpatient hospitalizations. This effect was marginally statistically significant ($p=0.07$).

- Increased behavioral health costs of $4,340 per person. This effect was statistically significant ($p<0.01$)

No other measures of utilization or cost were statistically significant, but point estimates were as follows:

- 16 fewer inpatient hospitalizations per 100 persons.
- Average length of stay per person decreased by approximately 0.09 days.
- 2.4 fewer physical health related visits per person.
- 54 more E&M visits per 100 persons.
- $191 more per person for ED visits.
- $179 less per person for physical health-related visits.

BHH+PC versus TAU

Regression models indicate that, compared to TAU, the first year of enrollment in a BHH with integrated primary care resulted in:

- 45 fewer inpatient hospitalizations per 100 persons. This effect was marginally statistically significant ($p=0.08$).
- Just over one (1.04) fewer ED visit per person. This effect was statistically significant ($p=0.04$).
- 16 more behavioral health visits per person. This effect was statistically significant ($p<0.01$).
- Almost 4 fewer (3.85) physical health related visits per person. This effect was marginally statistically significant ($p=0.08$).

- Increased behavioral health costs of $3,054 per person. This effect was statistically significant ($p<0.01$).

No other measures of utilization or cost were statistically significant, but point estimates were as follows:

- Decreased average length of stay per person of 1.4 days.
- 24 fewer E&M visits per 100 persons.
- Increased total costs per person of $429.
- $2,131 less per person for inpatient hospitalizations.
- $313 less per person for ED visits.
- $181 less per person for physical health-related visits.

BHH+PC versus BHH

Regression models indicate that, compared to BHH without primary care, the first year of enrollment in a BHH with integrated primary care resulted in:

- 86 fewer ED visits per 100 persons. This effect was marginally statistically significant ($p=0.06$).

There were no other statistically significant differences in healthcare utilization or costs for individuals in a BHH with integrated primary care and similar individuals in a BHH without primary care.

Point estimates for BHH+PC compared to BHH over the first year of enrollment show:

- 8 fewer inpatient hospitalizations per 100 persons

- Decreased average length of inpatient hospital stay per person of 1.3 days.
- 7.8 fewer behavioral health visits per person.
- 2 fewer physical health-related visits per person.
- 1.2 fewer E&M visits per person.
- Decreased total costs per person of $1,343.
- $27 less per person for inpatient hospitalizations.
- $176 less per person for ED visits.
- Decreased behavioral health costs of $1,112 per person
- $28 less per person for physical health-related visits.

CHAPTER 4: Conclusions and Discussion

The study sought to answer questions regarding the effectiveness of the BHH models compared to treatment as usual. First, the study evaluated the impact of the BHH intervention on individuals with SMI's health outcomes. The health outcomes of BMI, blood pressure and follow-up after hospitalization analyzed in this study showed no significant difference from entry into the BHH or BHH with PC compared to one year later for intervention participants. There were slight changes with an increase in BP and an increase in BMI for both groups. The follow-up after hospitalization measure decreased for both groups compared to the year prior in the BHH intervention. However, the positive probability for this measure is to increase since it evaluates the number of BHH participants that received follow- up within 30 days of inpatient discharge. Engagement in the BHH should have increased the likelihood that participants would have had this follow-up.

From this study, there is no statistical significance of an individual with SMI having changes in their BMI, BP or follow-up after hospitalization during year one of the intervention. Therefore, these findings did not support the hypothesis that the BHH intervention would have an impact on individuals with SMI's health outcomes of BMI, blood pressure and follow-up after hospitalization. There are several possible reasons that these hypotheses were not supported in year one of the BHH intervention. First, it was the first year of this intervention. Staff were learning the BHH model as defined by the state's waiver and addressing consumer's physical health in addition to their mental health involved a culture shift. Just as the staff had to learn a new intervention, the participants also had to be educated on how the BHH services differed from the other treatment types and what was

expected from them in the BHH program, which focused more on improving their health. Furthermore, since the state did not have the results of year one until after the first year of the intervention, they were not able to work with the BHH providers to improve outcomes and further evaluate fidelity to the BHH model. Given that it may take longer than one year to change participant's behaviors that impact health measures such as BMI and BP, longer term follow-up studies are needed. With year one being a year for learning the BHH intervention, the results from subsequent years should be positive as both staff and participants begin to focus on health outcomes that address weight loss and blood pressure. From the results of this study regarding these variables, a longer term study would be recommended to further evaluate the BHH intervention's effectiveness of improving health outcomes. This recommendation is supported in a similar study of integrated care in California that had similar results of no change in health outcomes in year one and recommended that a longer duration of studying the effects of health outcomes and costs would be necessary to understand a more valid impact of integrated care models (Gilmer, et al, 2018).

The second result of this study evaluated whether or not the BHH with Primary Care intervention was more effective than a BHH that has not added Primary Care in improving the health outcomes of individuals with SMI. Changes over time for BMI, blood pressure and follow-up after hospitalization of the BHH with PC intervention group did not differ significantly from changes in the group in the BHH without primary care. There was a marginal statistical difference of 86 fewer ED visits for individuals in the BH with PC compared to those in the BHH without primary care. While not statistically significant, individuals in the BHH with PC had a greater decrease of total costs per person overall in

physical health spending, with less costs in inpatient, ED, behavioral health and physical health related visits compared to those in BHH without PC. Those in the BHH with PC also had fewer inpatient hospitalizations and decreased lengths of stay in inpatient care compared to those in BHH without primary care. These findings did support that the BHH with PC was marginally more effective than a BHH that had not added PC for cost and utilization but not for blood pressure, BMI or follow-up after hospitalization.

Finally, this study evaluated whether or not individuals with SMI in the integrated care interventions had a greater reduction in healthcare costs and utilization than individuals with SMI receiving TAU. Both BHH interventions had an impact on health care costs and utilization compared to the TAU. For those in the BHH intervention, there were18 fewer inpatient hospitalizations per 100 persons per year, and 2.7 fewer physical health-related visits. However, the BHH intervention group had a significant increase in behavioral health visits, which may be attributed to the intervention successfully engaging individuals in behavioral health treatment and may explain why there was a $3,682 increase in behavioral health costs for individuals in the BHH. However, the BHH group had a decrease in physical health spending of $1,404 per person for inpatient hospitalizations, ED visits and physical health-related visits. The total costs for an individual in the BHH increased to $2,562 for all healthcare services combined compared to the TAU.

While both BHH interventions had an effect on healthcare costs and utilization, the BHH with PC had a marginally significant effect on healthcare costs and utilization compared to the TAU and BHH without PC in the first year of the intervention. For the BHH with PC, there was a statistically significant decrease in inpatient hospitalizations, ED visits and

physical health-related visits, and an increase in behavioral health visits. For the BHH with PC, there was an increase of behavioral costs of $3,054 per person but a decrease of $2625 per person in physical healthcare costs for inpatient, ED and other physical health-related visits. When comparing the two interventions, BHH with PC and BHH, the only statistically significant difference was that the number of ED visits decreased for the BHH with PC by 86 fewer visits per 100 persons, with a slight decrease in costs and utilization for the BHH with PC.

This study supported the hypothesis that the BHH interventions would have an impact on the healthcare spending and utilization of services in comparison to the TAU. However, the BHH interventions were expected to decrease the overall healthcare costs of individuals with SMI and this study's findings are that healthcare costs in year one increased for individuals in the BHH interventions compared to the TAU. With the increase in behavioral health spent, individuals in the BHH received more behavioral health treatment but used less high-cost medical services such as inpatient and ED visits, than the TAU. These findings suggest that over time as individuals stabilize with increased behavioral health treatment, their total healthcare costs may decrease with the more appropriate use of healthcare services. Several studies of integrated care models had similar results of reduced outpatient and inpatient medical costs and an increase in behavioral health spending associated with increased behavioral health utilization (Solis-Roman & Knickman, 2016, Clarke, et al, 2016; Rhodes, et al, 2017; Gilmer, et al, 2018; Kim, Higgins, Esposito & Hamblin, 2017;). This has implications for policy related to Medicaid spending, recognizing that while there may be

a physical health cost savings, there may be an increase of behavioral health costs, at least in the first year.

Implications for Medicaid Policy

The BHH service is a product of the Affordable Care Act and states were able to submit a waiver to implement the health home service for Medicaid reimbursement. While there were some grant funded integrated care programs available to behavioral health providers through the Substance Abuse and Mental Health Services Administration (SAMHSA) beginning in 2009, the BHH services was the first effort by CMS to have Medicaid covered integrated care. The ACA health home model allowed states to choose which chronic conditions to reimburse for the health home service. For the BHH services evaluated in this study, New Jersey chose to apply the health home model to individuals with serious mentally ill adults and serious emotionally disturbed diagnoses. As a result of this study, there are several implications for Medicaid policy regarding behavioral health homes.

This study's findings show that individuals in the BHH intervention had a difference in their physical and behavioral health care compared to the individuals in the TAU in the first year. Individuals in the BHH spent fewer days in inpatient care, had less frequency of inpatient care and had fewer ED and physical health visits while their behavioral health utilization. This suggests that with the increase in behavioral health treatment interventions, there was a decrease in physical health-care utilization. When developing future health home models, it is important that CMS evaluate the differences in utilization of the various

integrated care models to understand how the intervention impacts the ways that individuals with SMI utilize physical and behavioral health care.

The addition of primary care to the BHH yielded slightly better outcomes for individuals in the BHH intervention. This study found that individuals with the BHH with primary care had a marginally statistically significant greater reduction in inpatient care than those that had the BHH without primary care. While not statistically significant, individuals in the BHH with PC had a reduction in inpatient days, fewer ED visits and fewer outpatient physical and behavioral health visits. This suggests further studies need be conducted that compare the BHH and BHH with primary care models regarding health outcomes, costs and utilization to better inform Medicaid policy related to BHHs.

This study did not find that there was a significant difference in individuals with SMI's health outcomes in either BHH intervention. One would expect that a BHH would have a positive impact on a participants' BMI, blood pressure and follow-up after hospitalization in year one. Studies of the BHH intervention over time may reveal that there is a greater impact of the service on health outcomes. Therefore, it is important that longer term evaluation by CMS of this service continue to monitor the health outcomes to measure the impact over time of the BHH service.

Implications for Medicaid Financing

This study found that while there is an overall increase in healthcare spending for the individual in the BHH, the behavioral healthcare costs exceed the savings of the physical health side. For individuals in the BHH intervention, there a statistically significant increase

of total healthcare costs per person of $2,562 and an increase of behavioral health costs of $3,682 per person. However, there was a reduction in physical health care spending in both inpatient hospitalization, ED visits and physical health related visits. This study's findings that individuals in the BHH service had an increase in behavioral health spending is consistent with similar studies for year one of integrated care services (Barnes, Murphy, Fowler, & Rempfer, 2012; Kim et al., 2013; T. E. Smith et al., 2011; Rhodes, et al, 2017: Solis-Roman & Knickman, 2017). These findings imply that, for states that have or are looking to implement the behavioral health home model or other integrated care model, there needs to be fiscal planning for a potential increase in behavioral health spending and a savings in physical health care in year one of the intervention.

In order for CMS and states that implement the BHH service to plan for the financing and evaluating the return on investment (ROI) of this service, longer term studies need to be conducted to understand this impact. This investigation suggests that longer term studies need to include comparisons of the physical and behavioral health spending of an intervention group to a TAU group to effectively budget and evaluate costs and savings of the service. Other studies have found that over three to five years, there has been a significant ROI of integrated care models (Barnes, Murphy, Fowler, & Rempfer, 2012; Kim et al., 2013; T. E. Smith et al., 2011; Rhodes, et al, 2017: Solis-Roman & Knickman, 2017). There is great value in establishing a ROI of the BHH services in Medicaid in order for it to continue to be financed through the ACA and state budgets.

Implications for Social Work Practice

Social workers are a key member of the BHH intervention team and play an important part in engaging and linking individuals to physical and behavioral healthcare services. With this study's findings that there was no statistical difference in the health outcomes of blood pressure, BMI and follow-up after hospitalization, it is critical that the social worker be aware of the physical health issues that members face and participate in the team meetings regarding individual's care. In addition, social workers should continue to provide encouragement to the BHH participants in their investment in improving physical health goals in addition to their behavioral health goals.

In social work training and practice, while we are taught to focus on the emotional health and wellbeing of our clients, it is imperative that social workers in the BHH also have an understanding of the physical health issues that impact clients and how these health issues impact an individual's overall wellbeing. To advance the integrated care treatment models, several universities have integrated care training in the curriculum, which include the various health sciences and social work schools, to advance the training of healthcare professionals in integrated care and studies recommend that schools of social work explore and expand integrated care integration education (Spitzer & Davidson, 2013; Held, Mallory & Cummings, 2017; Held, et al., 2019; DeBonis, et al., 2015). Since social workers are key in the integrated care models, future social workers interested in careers in health care and integrated care, would benefit from integrated care curricula and collaborative training with other health science schools.

In addition to education including integrated care, it is important for social workers to participate in the development of the research around integrated care. Since social workers are on the BHH team, they should also be consulted to provide input on what measures will most effectively evaluate the program. And while the BHH evaluation in this study used Medicaid administrative data, the BHH intervention would benefit from a qualitative study of the impact of the BHH intervention on individuals' perspectives on their physical health care, the BHH intervention and whether or not the BHH intervention improved their quality of life and wellbeing. Also, conducting qualitative studies with primary data collection to supplement qualitative studies of administrative data would provide better insight into the effectiveness of the BHH model.

Strengths and Limitations

One of the strengths of this study is that the BHH intervention in this study only evaluated like programs in New Jersey. The BHH and TAU intervention settings both function under the same set of state and federal regulations as CMHCs. Therefore, the BHH and TAU are more likely to be similar than different in regard to their policies, programs and operations, thus increasing the confidence in the validity of this study's findings. In addition, the fact that the same Medicaid administrative data was used for the TAU and intervention groups for the healthcare costs and utilization evaluation provides further consistency among the study groups.

Another strength of this study is that the BHH interventions in New Jersey were aligned with the same health home state plan amendment which furthers the validity of the

BHH comparison of two BHH intervention models. While the amendment allowed the sites to have some flexibility of their teams, the required team structure, the participant eligibility and billing was the same in both intervention types. In addition, the BHH intervention sites received instruction and coaching through the same learning collaborative and were required to be certified by the state with the same set of standard requirements.

One of the limitations of this study is that it only evaluated year one of the BHH intervention, thus limiting the ability to evaluate the effectiveness for individuals who participate in the BHH for a longer period of time as well as evaluating the fidelity of the service over time. Also in year one, the staff and participants were adjusting to the BHH intervention and working out any issues related to the implementation. Since this study evaluated only year one of the intervention, the BHH sites were just beginning to implement this new service and acclimating to the BHH standards. Similarly, continuous enrollment in the interventions and the Medicaid program are difficult to measure in claims data. It is likely that a longer term study of participants in the BHH intervention that includes continuous enrollment in the interventions as well as Medicaid will provide a better understanding of the impact of the health outcomes, costs and utilization of BHH participants in comparison to a TAU, and allow further evaluation of the effectiveness of the service once staff and participants have had time to implement the BHH intervention.

Another limitation of this study is the fact that there wasn't health outcome data available for the TAU group which include blood pressure and BMI. So, this study was not able to compare the health outcomes of the TAU to the BHH intervention groups. It is unknown if these measures were better or worse than the TAU. Future studies of the BHH

intervention should include these measures for the TAU group to gain a better understanding of any differences that may exist in the different treatment groups and to see if, in fact, the BHH intervention had a statistically significant difference in health outcomes. However, obtaining the BMI and BP or other health measures for the TAU would need to be from healthcare providers and independent of BHH or other behavioral health providers. Otherwise, the mere collection of this medical information by the behavioral health provider would become an integrated service and this service would have to be defined as an integrated care intervention in future studies.

Several limitations exist in regards to the data collected and study design. The administrative claims data used does not allow for adjustments due to disease severity or unobserved differences not found in claims data. The intervention and TAU groups were matched on diagnosis and not severity of disease. Additionally, since this study is not a randomized trial, selection may have a role in the results, since participants in the intervention were voluntary and the TAU groups did not have this intervention available as an option for treatment, as BHH was not yet implemented in their county of residence. Another limitation is the study design included a large number of comparisons which raised the probability of finding significant results due to random variations. However, this study did not see great variance in results and since it was exploratory, adjustments for multiple comparisons were not undertaken.

Another limitation is the fact that participants had Medicaid only. If participants in this study also had Medicare, or dual coverage, the health outcomes might have been more

significant in variations in health outcomes, costs and utilization among the treatment and TAU groups.

While the fact that this study was conducted exclusively in New Jersey is a strength, it is also a limitation. It would be helpful in future studies to compare different states' BHH interventions to measure the effectiveness of the NJ model relative to other state BHH programs. Since each state was permitted to set up health homes in different manners to address the SMI population, comparing NJ BHHs to other state BHHs might enable the assessment of different state policies in regards to the impact of the BHH models developed.

Recommendations

From the results of this study, it is recommended that further quantitative and qualitative studies of the BHH intervention are needed to further evaluate the effectiveness of the intervention in positively affecting participants' health outcomes as well as the benefit to Medicaid programs. Quantitatively, there should be a pre and post study of the intervention participants' claims data of utilization over a period of three to five years. And a study design that involves a control group and compares health outcomes including BMI, blood pressure and diabetes measures such as A1C over the course of three to five years. And also a study design that evaluates the return on investment of the BHH integrated care model for both behavioral and physical health services over the course of five years, including participants of both Medicaid as well as individuals who are dually insured by Medicare and Medicaid and identified by age and disability.

Qualitative research of the individual participants would provide further insight of the benefit of the BHH service to the Medicaid member and if it improved their quality of life. This would also change the BHH program design to understand how to improve the BHH intervention to meet the needs of participants. Qualitative studies of staff who were trained and transitioned from their previous positions into positions of the BHH intervention may offer further insight into the training needs and characteristics that are unique to the BHH intervention. A further recommendation is that schools of social work should be leading, - or at least participating in, developing and incorporating integrated care training into their curricula for social work students as it is likely that this is the future direction for those serving individuals with severe disorders.

Conclusion

Given the importance of integrated care to individuals with serious mental illness, these results indicate that with the behavioral health home intervention, individuals began using physical and behavioral healthcare services differently, and consequently, the Medicaid costs shifted from physical health to behavioral health in the first year of the intervention. There needs to be further evaluation of both the physical and behavioral healthcare Medicaid costs spent to determine if there is any reduction in costs and return on investment (ROI) due to changes in utilization and improved or controlled physical health conditions over time. In addition, studies of longer periods of time in the BHH intervention are needed to evaluate the effectiveness of improving health outcomes for individuals with SMI.

REFERENCES

American Psychiatric Association, & American Psychiatric Association. Task Force on DSM-IV. (1994). *Diagnostic and statistical manual of mental disorders: DSM-IV.* Amer Psychiatric Pub Inc.

An, W. (2016). Combining difference-in-differences and matching for panel data analysis. 2016 Stata Conference 21, Stata Users Group. https://ideas.repec.org/p/boc/scon16/21.html

Austin PC. Optimal caliper widths for propensity-score matching when estimating differences in means and differences in proportions in observational studies. *Pharmaceutical Statistics*. 2010;10(2):150-161.

Austin PC. An introduction to propensity score methods for reducing the effects of confounding in observational studies. *Multivariate Behavioral Research*. 2011;46(3):399-424.

Barnes, A. L., Murphy, M. E., Fowler, C. A., & Rempfer, M. V. (2012). Health-related quality of life and overall life satisfaction in people with serious mental illness. *Schizophrenia Research and Treatment, 2012*

Berren, M. R., Santiago, J. M., Zent, M. R., & Carbone, C. P. (1999). Health care utilization by persons with severe and persistent mental illness. *Psychiatric Services, 50*(4), 559-561.

Boyd, C., Leff, B., Weiss, C., Wolff, J., Hamblin, A., & Martin, L. (2010). Clarifying multimorbidity patterns to improve targeting and delivery of clinical services for medicaid populations. *Center for Health Care Strategies, Inc,*

Boyer, C. A., McAlpine, D. D., Pottick, K. J., & Olfson, M. (2000). Identifying risk factors and key strategies in linkage to outpatient psychiatric care. *American Journal of Psychiatry, 157*(10), 1592-1598.

Carrick, J., Eilers, R., Fresolone, V., King, J., & Kennedy, R. (2014). *New jersey health home provisional certification checklist* (First Edition) New Jersey Division of Mental Health and Addiction Services.

Centers for Medicare and Medicaid Services. (2013). Health home core quality measures. *SMD# 13-001*(ACA #23)

Center for Medicare and Medicaid Services. (2019). *Medicaid Health Homes: SPA Overview.* Health Home: Information Resource Center.

Chakravarty, S., & Cantor, J. (2016). Informing the design and evaluation of superuser care management initiatives: accounting for regression-to-the-mean. *Medical Care, 00*(00), 1-8.

Clarke RMA, Jeffrey J, Grossman M, Strouse T, Gitlin M, Skootsky SA. Delivering on accountable care: Lessons from a behavioral health program to improve access and outcomes. *Health Aff*. 2016;35(8):1487-1493.

CMS. (2015). Medicaid health homes: SPA overview. Retrieved from https://www.medicaid.gov/state-resource-center/medicaid-state-technical-assistance/health-homes-technical-assistance/downloads/hh-spa-overview-dec-2015.pdf

Collins, C., Hewson, D.L., Munger, R., & Wade, T. (2010). *Evolving models of behavioral health integration in primary care* Milbank Memorial Fund New York, NY.

Colton, C. W., & Manderscheid, R. W. (2006). Congruencies in increased mortality rates, years of potential life lost, and causes of death among public mental health clients in eight states. *Prev Chronic Dis, 3*(2), A42.

Compton, M., Rudisch, B., Craw, J., Thompson, T., & Owens, D. (2006). Predictors of missed first appointments at community mental health centers after psychiatric hospitalization. *Psychiatric Services, 57*(4), 531-537.

Cook, J. A., Razzano, L. A., Swarbrick, M. A., Jonikas, J. A., Yost, C., Burke, L., . . . Santos, A. (2015). Health risks and changes in self-efficacy following community health screening of adults with serious mental illnesses. *PloS One, 10*(4).

Cuffel, B. J., Held, M., & Goldman, W. (2002). Predictive models and the effectiveness of strategies for improving outpatient follow-up under managed care. *Psychiatric Services, 53*(11), 1438-1443.

Daw JR, Hatfield LA. Matching and regression to the mean in Difference-in-Differences analysis. *Health Serv Res*. 2018;53(6):4138-4156.

DeBonis JA, Becker MA, Yoo J, Capobianco J, Salerno A. Advancing social work education: Lessons learned from piloting an integrated healthcare curriculum. *Journal of Social Service Research*. 2015;41(5):594-621.

Dickerson, F. B., Brown, C. H., Daumit, G. L., LiJuan, F., Goldberg, R. W., Wohlheiter, K., & Dixon, L. B. (2006). Health status of individuals with serious mental illness. *Schizophrenia Bulletin, 32*(3), 584-589.

Druss, B. G., Rohrbaugh, R. M., Levinson, C. M., & Rosenheck, R. A. (2001). Integrated medical care for patients with serious psychiatric illness: A randomized trial. *Archives of General Psychiatry, 58*(9), 861.

Druss BG, Goldman HH. Integrating health and mental health services: A past and future history. *Am J Psychiatry*. 2018;175(12):1199-1204.

Druss BG, von Esenwein SA, Glick GE, et al. Randomized trial of an integrated behavioral health home: The health outcomes management and evaluation (HOME) study. *Am J Psychiatry*. 2017;174(3):246-255.

Flegal, K. M., Carroll, M. D., Ogden, C. L., & Curtin, L. R. (2010). Prevalence and trends in obesity among US adults, 1999-2008. *Jama, 303*(3), 235-241.

Freeman, E., McGuire, C. A., Thomas, J. W., & Thayer, D. A. (2014). Factors affecting costs in medicaid populations with behavioral health disorders. *Medical Care, 52 Suppl 3*, S60-6.

Garrido MM, Kelley AS, Paris J, et al. Methods for constructing and assessing propensity scores. *Health Serv Res*. 2014;49(5):1701-1720.

General, S. (1999). Mental health: A report of the surgeon general. Rockville, MD: US department of health and human services. *Substance Abuse and Mental Health Services Administration, Center for Mental Health Services, National Institutes of Health, National Institute of Mental Health,*

Gerolamo, A. M., Kim, J. Y., Brown, J. D., Schuster, J., & Kogan, J. (2014). Implementation of a reverse colocation model: Lessons from two community behavioral health agencies in rural Pennsylvania. *The Journal of Behavioral Health Services & Research,* 1-16.

Gilmer TP, Avery M, Siantz E, et al. Evaluation of the behavioral health integration and complex care initiative in medi-cal. *Health Aff*. 2018; 37(9):1442-1449.

Hales Craig M., Carroll, Margaret D., Fryar Chery D., Ogden, Cynthia L. (2017). *Prevalence of Obesity Among Adults and Youth: United States 2015-2016.* US Department of Health and Human Services, Center for Disease Control: National Center for Health Statistics.

Harvard Mental Health Letter. (2003). Mental illness and medical care.(Cambridge (MA): Harvard University)

Held ML, Mallory KC, Cummings S. Preparing social work students for integrated health care: Results from a national study. *Journal of Social Work Education*. 2017;53(3):435-448.

Held ML, Black DR, Chaffin KM, Mallory KC, Milam Diehl A, Cummings S. Training the future workforce: Social workers in integrated health care settings. *Journal of Social Work Education*. 2019;55(1):50-63.

Hert, M., Correll, C. U., Bobes, J., Cetkovich-Bakmas, M., Cohen, D., Asai, I., Ndetei, D. M. (2011). Physical illness in patients with severe mental disorders. I. prevalence, impact of medications and disparities in health care. *World Psychiatry, 10*(1), 52-77.

Hert, M., Schreurs, V., Vancampfort, D., & Winkel, R. (2009). Metabolic syndrome in people with schizophrenia: A review. *World Psychiatry, 8*(1), 15-22.

Imai K, King G, Stuart EA. Misunderstandings between experimentalists and observationalists about causal inference. *Journal of the Royal Statistical Society. Series A (Statistics in Society)*. 2008;171(2):481-502.

Institute of Medicine (US). Committee on Quality of Health Care in America. (2001). *Crossing the quality chasm: A new health system for the 21st century* National Academies Press.

Jones, D. R., Macias, C., Barreira, P. J., Fisher, W. H., Hargreaves, W. A., & Harding, C. M. (2004). Prevalence, severity, and co-occurrence of chronic physical health problems of persons with serious mental illness. *Psychiatric Services (Washington, DC), 55*(11), 1250.

Jones, I. R., Ahmed, N., Catty, J., McLaren, S., Rose, D., Wykes, T., & Burns, T. (2009). Illness careers and continuity of care in mental health services: A qualitative study of service users and carers. *Social Science & Medicine, 69*(4), 632-639.

Kaiser Family Foundation Status of state action on medicaid expansion decision. (2016). Retrieved from https://www.kff.org/medicaid/issue-brief/status-of-state-medicaid-expansion-decisions-interactive-map/ (8/20/2019).

Kennedy-Hendricks A, Daumit GL, Choksy S, Linden S, McGinty EE. Measuring variation across dimensions of integrated care: The maryland medicaid health home model. *Administration and Policy in Mental Health and Mental Health Services Research*. 2018;45(6):888-899.

Kim, J., Gerolamo, A. M., & Brown, J. (2013). Lessons from three pilots to integrate physical and behaviroal health care for mediaid beneficiaries in pennsylvania. *Presentation at the Center of Excellence for Disability Research,* National Conference. (March)

Kim JY, Higgins TC, Esposito D, Hamblin A. Integrating health care for high-need Medicaid beneficiaries with serious mental illness and chronic physical health conditions at managed care, provider, and consumer levels. *Psychiatr Rehabil J*. 2017;40(2):207-215

Kodner, D. L., & Spreeuwenberg, C. (2002). Integrated care: Meaning, logic, applications, and implications–a discussion paper. *International Journal of Integrated Care, 2*

Kreyenbuhl, J., Nossel, I. R., & Dixon, L. B. (2009). Disengagement from mental health treatment among individuals with schizophrenia and strategies for facilitating connections to care: a review of the literature. *Schizophrenia Bulletin,* (35), 696--703.

Kronick, R. G., Bella, M., & Gilmer, T. P. (2009). The faces of medicaid III: Refining the portrait of people with multiple chronic conditions. *Center for Health Care Strategies, Inc,*

Kruse, G. R., Rohland, B. M., & Wu, X. (2002). Factors associated with missed first appointments at a psychiatric clinic. *Psychiatric Services, 53*(9), 1173-1176.

Lambert, N. (2012). Understanding and supporting the physical health needs of clients: Nichola lambert explores the factors that contribute to the ongoing health inequalities affecting people with mental health problems, and what nurses can do to address them. *Mental Health Practice, 15*(10), 14-19.

Lichstein, J. C., Domino, M. E., Beadles, C. A., Ellis, A. R., Farley, J. F., Morrissey, J. P., . . . Jackson, C. T. (2014). Use of medical homes by patients with comorbid physical and severe mental illness. *Medical Care, 52 Suppl 3*, S85-91.

Malzberg, B. (1932). Life tables for patients with mental disease. *Journal of the American Statistical Association, 27*(177A), 160-174.

Manderscheid, R., Druss, B., & Freeman, E. (2008). Data to manage the mortality crisis. *International Journal of Mental Health, 37*(2), 49-68.

Manderscheid, R., & Kathol, R. (2014). Fostering sustainable, integrated medical and behavioral health services in medical settings. *Annals of Internal Medicine, 160*, 61-65.

Maragakis, A., RachBeisel, J., & Blount, A. (2015). Preliminary results from a newly established behavioral health home early identification of glucose metabolism disorders in individuals with serious mental illness. *Health Services Research and Managerial Epidemiology, 2*.

Mark, T. L., Levit, K. R., Vandivort-Warren, R., Buck, J. A., & Coffey, R. M. (2011). Changes in US spending on mental health and substance abuse treatment, 1986-2005, and implications for policy. *Health Affairs (Project Hope), 30*(2), 284-292.

Mauer, B. (2004). Behavioral health/primary care integration: The four quadrant model and evidence-based practices. *Rockville, MD: National Council for Community Behavioral Health Care,*

Mauer, B. J., & Druss, B. G. (2010). Mind and body reunited: Improving care at the behavioral and primary healthcare interface. *The Journal of Behavioral Health Services & Research, 37*(4), 529-542.

Mauer, B. (2003). Background paper: Behavioral health/primary care Integration–Models, competencies and infrastructure. *National Council for Community Behavioral Healthcare (NCCBH): Rockville*

McCance-Katz, E. The Substance abuse and mental health services administration (SAMHSA): New Directions. Psychiatric services 69:10. October 2018.

McGinty EE, Kennedy-Hendricks A, Linden S, Choksy S, Stone E, Daumit GL. An innovative model to coordinate healthcare and social services for people with serious mental illness: A mixed-methods case study of maryland's medicaid health home program. *Gen Hosp Psychiatry*. 2018;51:54-62.

Melek, S. P., Norris, D. T., & Paulus, J. (2014). *Economic impact of integrated medical-behavioral healthcare: Implications for psychatry.* (No. April). Denver, CO: Milliman, Inc. for the American Psychiatric Association.

Melek, S. P. (2012). *Bending the medicaid healthcare cost curve through financially sustainable medical-behavioral integration.* (No. July). Denver, CO: Miliman - Research Report.

Millwee B, Quinn K, Goldfield N. Moving toward paying for outcomes in medicaid. *J Ambulatory Care Manage*. 2018; 41(2):88.

Mirza, I., & Phelan, M. (2002). Managing physical illness in people with severe mental illness. *British Journal of Hospital Medicine, 63*(9), 535-539.

Missouri HealthNet and the Department of Mental Health. (2012). *Missouri community mental health center heatlh care homes: Six month review.* (Six Month review No. October).MO HealthNet and the Department of Mental Health.

National Association of State Mental Health Program Directors. (October 2006). *Morbidity and mortality in people with serious mental illness.* (Series of Technical Reports No. 13). National Association of State Mental health Program Directors Medical Directors Council.

Olfson, M., Gerhard, T., Huang, C., Crystal, S., & Stroup, T. S. (2015). Premature mortality among adults with schizophrenia in the United States. *JAMA Psychiatry,* 1-10.

Parks, J., Pollack, D., Bartels, S., & Mauer, B. (2005). Integrating behavioral health and primary care services: Opportunities and challenges for state mental health authorities. *Technical Report,*

Parks, J., Svendsen, D., Singer, P., Foti, M. E., & Mauer, B. (2006). *Morbidity and mortality in people with serious mental illness* National Association of State Mental Health Program Directors (NASMHPD) Medical Directors Council Alexandria, VA.

Pickett, S. A., & Batia, K. (2015). Integrated health care for people with psychiatric disabilities. *American Journal of Psychiatric Rehabilitation, 18*(1), 1-4.

Pratt, L., Druss, B., Manderscheid, R., & Walker, E. R. (2016). Excess mortality due to depression and anxiety in the United States: results from a nationally representative survey. *General Hospital Psychiatry, 39*, 39-45.

Protection, P., & Act, A. C. (2010). Patient protection and affordable care act. *Public Law,* (111-148)

Raney, L. E. (2015). *Integrated care: Working at the interface of primary care and behavioral health* American Psychiatric Pub

Regier DA, Narrow WE, Rae DS, Manderscheid RW, Locke BZ, Goodwin FK. The de facto US mental and addictive disorders service system: Epidemiologic catchment area prospective 1-year prevalence rates of disorders and services. *Arch Gen Psychiatry*. 1993;50(2):85-94.

Rhodes KV, Basseyn S, Gallop R, Noll E, Rothbard A, Crits-Christoph P. Pennsylvania's medical home initiative: Reductions in healthcare utilization and cost among medicaid patients with medical and psychiatric comorbidities. *Journal of General Internal Medicine*. 2016; 31(11):1373-1381.

Robson, D., & Gray, R. (2007). Serious mental illness and physical health problems: A discussion paper. *International Journal of Nursing Studies, 44*(3), 457-466.

Rossotto, E., Wirshing, D. A., & Liberman, R. P. (2004). Rehab rounds: Enhancing treatment adherence among persons with schizophrenia by teaching community reintegration skills. *Psychiatric Services, 55*(1), 26-27.

Rutgers Biomedical and Health Sciences Working Group on Medicaid High Utilizers. (2016). *Analysis and recommendations for Medicaid high utilizers in New Jersey.* Rutgers University: Rutgers Center for State Health Policy, http://www.cshp.rutgers.edu/Downloads/10890.pdf (website obtained 2/7/2016)

SAMHSA-HRSA. (May 2012). *Behavioral health homes for people with mental health and substance use conditions: The core clinical features.* ().

Scharf, D. M., Eberhart, N. K., Hackbarth, N. S., Horvitz-Lennon, M., Beckman, R., Han, B,. Burnam, M. A. (2013). *Evaluation of the SAMHSA primary and behavioral health care integration (PBHCI) grant program: Final report.* (Final Report).Rand Health, Rand Corporation.

Smith, T. E., Erlich, M. D., & Sederer, L. I. (2013). Integrating general medical and behavioral health care: the New York state perspective. *Psychiatric Services, 64*(9), 828-831.

Smith, T. E., Appel, A., Donahue, S. A., Essock, S. M., Jackson, C. T., Karpati, A.,. Sederer, L. I. (2011). Public-academic partnerships: Using medicaid claims data to identify service gaps for high-need clients: The NYC mental health care monitoring initiative. *Psychiatric Services, 62*(1), 9-11.

Smith, V., Gifford, K., Ellis, E., Rudowitz, R., & Snyder, L. (2012). Medicaid today; preparing for tomorrow: A look at state medicaid program spending, enrollment and policy trends. *Kaiser Commission on Medicaid and the Uninsured (October 2012),*

Sokal, J., Messias, E., Dickerson, F. B., Kreyenbuhl, J., Brown, C. H., Goldberg, R. W., & Dixon, L. B. (2004). Comorbidity of medical illnesses among adults with serious mental illness who are receiving community psychiatric services. *The Journal of Nervous and Mental Disease, 192*(6), 421-427. doi:00005053-200406000-00004 [pii]

Solis-Roman, Claudia, Knickman, James (2017). *Project to evaluate the impact of Fountain House progams on Medicaid utilization and expenditures.* New York University, Health Evaluation and Analytics Lab. NYC: New York University.

Spitzer WJ, Davidson KW. Future trends in health and health care: Implications for social work practice in an aging society. *Soc Work Health Care*. 2013;52(10):959-986.

Stein, B., Kogan, J., Sorbero, M., Thompson, W., & Hutchinson, S. (2007). Predictors of timely follow-up care among medicaid-enrolled adults after psychiatric hospitalization. *Psychiatric Services, 58*(12), 1563-1569.

Substance Abuse and Mental Health Services Administration. The 10 By 10 Campaign: A National Wellness Action Plan to Improve Life Expectancy by 10 Years in 10 Years for People with Mental Illness. Retrieved on 2/21/2016 from http://store.samhsa.gov/product/The-10-By-10-Campaign-A-National-Wellness-Action-Plan-to-Improve-Life-Expectancy-by-10-Years-in-10-Years-for-People-with-Mental-Illness/SMA10-4476

Substance Abuse and Mental Health Services Administration. (2010). National expenditures for mental health services and substance abuse treatment. *DDHS Pub. no. SMA-10-4612, SAMHSA,*

Toalson, P., Ahmed, S., Hardy, T., & Kabinoff, G. (2004). The metabolic syndrome in patients with severe mental illnesses. *Primary Care Companion to the Journal of Clinical Psychiatry, 6*(4), 152.

Unützer, J., Harbin, H., & Druss, M. (2013). The collaborative care model: An approach for integrating physical and mental health care in medicaid health homes. *Center for Health Care Strategies and Mathematica Policy Research, May,*

Viron, M., Zioto, K., Schweitzer, J., & Levine, G. (2014). Behavioral health homes: An opportunity to address healthcare inequities in people with serious mental illness. *Asian Journal of Psychiatry, 10*, 10-16.

Wellstone, P., & Domenici, P. (2008). Mental health parity and addiction equity act of 2008

APPENDICES

APPENDIX A: BHH Study SMI Inclusive Diagnoses

BHH study SMI inclusive diagnostic codes

ICD 9:

- 295 Schizophrenic psychoses (295.0 thru 295.9)
- 296 Affective psychoses (296.0-296.9)
- 297 Paranoid states (297.0-297.9)
- 298 Other nonorganic psychoses (298.0-298.9)

ICD 10:

- F20 Schizophrenia (F20.0-F20.9)
- F21 Schizotypal disorder (F21.0)
- F22 Persistent delusional disorders (F22.0-F22.9)
- F23 Acute and transient psychotic disorders (F23.0-F23.9)
- F24 Induced delusional disorder (F24.0)
- F25 Schizoaffective disorders (F25.0-F25.9)
- F28 Other nonorganic psychotic disorders (F28.0)
- F29 Unspecified nonorganic psychosis (F29.0)

- F30 Manic episode (F30.0-F30.9)
- F31 Bipolar affective disorder (F31.0-F31.9)
- F32 Depressive episode (F32.0-F32.9)
- F33 Recurrent depressive disorder (F33.0-F33.9)
- F34 Persistent mood (affective) disorders (F34.0-F34.9)
- F38 Other mood (affective) disorders (F38.0-F38.8)
- F39 Unspecified mood (affective) disorder (F39)

APPENDIX B – Certification Checklist

With permission of the NJ Department of Human Services, Division of Mental Health and Addiction Services, the tool for BHH certification *New Jersey Health Home Provisional Certification Checklist* is attached (Carrick, et al., 2014).

State of New Jersey
DEPARTMENT OF HUMAN SERVICES
DIVISION OF MENTAL HEALTH AND ADDICTION SERVICES
222 SOUTH WARREN STREET
PO BOX 700
TRENTON, NJ 08625-0700

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor
Commissioner

JENNIFER VELEZ
Commissioner

LYNN A. KOVICH
Assistant

New Jersey Health Home Provisional Certification Checklist

Agency:

Location:

Date:

Implementation

____ **Do you have a written mission statement and program description that includes the goals of the health home model and approach to person centered/directed care?**

____ Do you have a written health home communication plan aimed at staff, people receiving services, and the community (including primary care, hospitals, and MCOs) that reflects how the health home connects to overall organizational vision/mission? Please provide an evaluation component that determines effectiveness of communication.

____ Do you have policies and procedures for a partnership and referral/coordination process with local hospitals?

____ **Do you have a model of working with primary care and care coordination? Are policies and procedures in place that support this model?**

____ Do you have policies and procedures that address urgent care and access to care?

____ Do you have policies and procedures detailing how the service will integrate within the continuum of behavioral health and primary health care services and recovery supports available in the geographic area where services are provided (include specialty health care and dentistry)?

____ Do you have policies and procedures describing how you will outreach and engage BHH enrollees in health home services, support services, prevention, wellness, and specialist care?

____ How are you ensuring consumer choice and informed consent?

Staffing/Recruitment/Training

____ Have you identified your core team members? Do you have staff in place to meet the BHH goals? Provide a description of the BHH team, the staff roles and responsibilities, and formal job descriptions. If a full team is not currently in place, please provide documentation to support ongoing recruitment as well as a detailed coverage plan.

____ Do you have a policies and procedures in place to support regular supervision of the health home team ensuring: regular supervision occurs, the use of data in supervision, and individual and peer group supervision?

____ Provide a written plan on how your organization plans to utilize peers in the health home. Please outline a plan for recruitment of peers.

____ Identify a training model for all health home staff that will include staff competencies to work effectively across health systems, to work effectively as a multidisciplinary team, and to adjust appropriately as needs are identified in disease registries. Please provide a training roster and/or training schedule.

____ Identify a training model for all health home staff that will include staff competencies related to developing and implementing integrated person centered/directed care plans. Please provide a training roster and/or training schedule.

____ Identify a training model for all health home staff that will include staff competencies in trauma informed care. Please provide a training roster and/or training schedule.

____ What two "additional" team members are you using or actively planning to use on the health home team? It is expected that one additional team member be added to the team from a clinical field to include: nutritionist, dietician, pharmacist, holistic healer, hospital liaison, diabetes educator, exercise specialist, or other as approved by DMHAS and one additional team member be added from a non-clinical field to include: a quality assurance specialist, a data manager, an IT professional, an administrative assistant, or a driver. Provide recruitment plan if not already working on team.

Services

____ Do you have policies and procedures in place to provide written information to the person receiving services and/or their family members and care givers that is formatted in a manner that is appropriate to the individual's needs?

____ Do you have policies and procedures in place that ensure enhanced patient access to the health home team, including the development of alternatives to face to face visits, such as telephone or email access 24 hours a day, 7 days a week?

____ Do you have policies and procedures in place that promote the use of evidence based wellness and prevention including, at minimum: smoking cessation, diabetes, asthma, self-help resources, and other services based on individual and family needs.

____ Provide a written schedule of wellness activities the health home will provide

____ Provide a written schedule of organizational wellness activities and approaches.

____ Do you have policies and procedures in place to assure specific medical screenings and treatment services consistent with current professional standards of care that are provided to the individuals receiving health home services?

____ Have you developed benchmarks for and implemented access to preventative testing and a connection to primary care?

____ Do you have policies and procedures to create, document, execute, and update individualized, integrated, person centered plans of care? Do these policies ensure that the consumer and/or his/her family and caregivers are playing a central role in the development and implementation of the care plan? Please provide a template for your current integrated care plan.

____ How are you assessing consumer health concerns and needs?

____ How are you assessing consumer self-care abilities?

____ How are you engaging supports, such as family members, that will help enable and promote self-care?

Support Services

Identify or have in place an electronic medical record (EMR) that qualifies under the meaningful use provision of the HITECH act to create, document, execute, and update a plan of care for every consumer.

Identify or have in place an EMR that allows the health information and plan of care to be accessible to the interdisciplinary team of providers and allows for population management and identification of gaps in care.

Identify or have in place an EMR that has a behavioral pharmacy management system to determine problematic prescribing patterns

Please provide a written description of how the provider will use Health Information Technology to support care management. Is a HIE available to your organization? If yes, do you have a policy that outlines your organization's ability to participate? If no, do you have a policy that outlines how your organization plans to share information to coordinate care?

Establish and provide data for disease registries to input annual metabolic screening, track and measure care of the health home population. (Year Two Provisional Certification)

Develop a system of automated care reminders (Year Two Provisional Certification).

Do you have the capacity to collect and track quality measures identified as required by CMS, NJ FamilyCare, or NJ DMHAS?

Are you currently tracking consumer and system outcomes which must include rates of hospitalizations and emergency room visits?

____ Do you have a quality improvement team that has the primary responsibility for evaluative activities?

____ **Please provide a written plan to regularly evaluate the service plan, how it will be shared with consumers, and how it will be used to plan and implement care.**

____ Do you have a process to use data meaningfully to follow up on tests, treatment, services, and referrals?

____ **Please provide a written outline for specific methods to be used to measure and evaluate service outcomes and the quality and service, including agency specific forms and tools, which will be employed to capture and assess both consumer and program outcomes.**

____ Please provide a detailed plan and corresponding policies that identify accounting principles that assure BHH funds are resourcing only the health home team and services

APPENDIX C: Memorandum of Understanding and Data Use Agreement

#3

THE DEPARTMENT HUMAN SERVICES (DHS)

DIVISION OF MEDICAL ASSISTANCE AND HEALTH SERVICES (DMAHS)

AND

ROXANNE KENNEDY

FOR

BEHAVIORAL HEALTH HOME EVALUATION PROJECT

This Amendment #3 ("Amendment #3") to the 2017 MOA (as hereinafter defined) is made and entered into by and between Roxanne Kennedy, having an address of 24 N. Congress Street, Newtown, PA 18940, and the Department of Human Services ("DHS"), Division of Medical Assistance and Health services ("DMAHS"), located at 7 Quakerbridge Plaza, P.O. Box 712, Trenton, NJ 08625 (Collectively referred to' as the "Parties").

WITNESSETH .

WHEREAS, Roxanne Kennedy and DMAHS previously entered into a Memorandum of Agreement (the "2017 MOA") dated January 18, 2017, for the purpose of evaluating the effectiveness of DMAHS's Behavioral health Homes in junction with Roxanne Kennedy's doctoral study at the University of Pennsylvania; and

WHEREAS, Amendments #1 and #2 were entered into on February 16, 2017 and February 15, 2018, respectively, to reflect staffing changes, to those specified within the original terms of the 2017 MOA; and

WHEREAS, the Parties now wish to amend the MOA, to extend the scope of the data DMAHS will provide to Roxanne Kennedy and her staff as specified in section 1.3 (Scope of work) of the 2017 MOA;

NOW THEREFORE, in consideration of the foregoing recitals and other good and valuable consideration, the receipt and sufficiency of is hereby acknowledged, the Parties hereto, intending to be legally bound hereby, agree to the following:

1. Paragraph 1.3 of the 2017 MOA is hereby amended as follows:

(3) for comparison purposes, a data set as set forth below of individuals of similar age, sex, ethnicity, diagnosis, and county of residence (counties contiguous to Mercer and Bergen Counties).

The limited data subsets (2) and (3) will include the following data elements:

- Encrypted ID#
- Age
- Sex
- Ethnicity
- County of residence
- Claim data for one year prior to the initial BHH procedure code that occurs during or after 2014 and through December 31, 2017. Claim data will not include identification of any managed care company.
- Claim data for one year prior to July 1, 2014 for the comparison group and through December 31, 2017. Claim data will not include identification of any managed care
- Any other available data that DMAHS authorizes to be provided relevant to this population.

Such amendment shall be for the duration of the 2017 MOA or until such time as further amendment is made to the 2017 MOA; and

2. Except as set forth in this Amendment #3, the 2017 MOA with previous Amendments, are unaffected and shall continue in full force and effect in accordance with their terms. If there is any conflict between this Amendment #3 and the 2017 MOA and its previous Amendments, the terms of this Amendment #3 will prevail.

3. The parties agree to the form and content of this Amendment #3.

New Jersey Department of Human Services, Division of Medical Assistance Health Services:

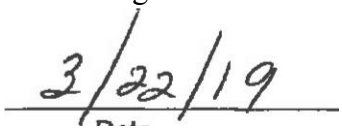
Signature:  Meghan Davey, Director

3/29/19
Date

Roxanne Kennedy, DSW Candidate:

Signature:

Roxanne Kennedy, DSW Candidate



Date

THE DEPARTMENT HUMAN SERVICES (DHS)

DIVISION OF MEDICAL ASSISTANCE AND HEALTH SERVICES (DMAHS),

AND

ROXANNE KENNEDY

FOR

BEHAVIORAL HEALTH HOME EVALUATION PROJECT

This Amendment #2 ("Amendment #2") to the 2017 MOA (as hereinafter defined) is made and entered into by and between Roxanne Kennedy, having an address of 24 N. Congress Street, Newtown, PA 18940, and the Department of Human Services ("DHS"), Division of Medical Assistance and Health services ("DMAHS"), located at 7 Quakerbridge Plaza, P.O. Box 712, Trenton, NJ 08625 (Collectively referred to as the "Parties").

WITNESSETH .

WHEREAS, Roxanne Kennedy and DMAHS previously entered into a Memorandum of Agreement (the "2017 MOA") dated January 18, 2017, for the purpose of evaluating the effectiveness of DMAHS's Behavioral health Homes iri conjunction with Roxanne Kennedy's doctoral research at the University of Pennsylvania; and

WHEREAS, Amendment #1 was entered into on February 16, 2017 to reflect changes to the staff for both parties, as specified in the original terms of the 2017 MOA; and

WHEREAS, Section 111. 1 of the 2017 MOA was amended to specify that Michelle Evans-Chase, an individual who is no longer employed by Roxanne Kennedy, as Roxanne Kennedy's staff; and

WHEREAS, the Parties wish to amend the MOA, specifically insofar as staff for Roxanne Kennedy has changed since Amendment #1 to the 2017 MOA was signed in 2017 and new staff members have been appointed;

NOW THEREFORE, in consideration of the foregoing recitals and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties hereto, intending to be legally bound hereby, agree to the following:

1. Paragraph 111.1 of the 2017 MOA is hereby amended to reflect that Roxanne Kennedy's staff is Kristen Lloyd for the duration of the MOA or until such time as further amendment is made to the 2017 MOA; and

2. Except as set forth in this Amendment #2, the 2017 MOA with previous Amendments, are unaffected and shall continue in full force and effect in accordance with their terms. If there is any conflict between this Amendment #2 and the 2017 MOA and its previous Amendments, the terms of this Amendment #2 will prevail.

3. The parties agree to the form and content of this Amendment #2 and agree that this Amendment shall become effective as of the November 2018.

New Jersey Department of Human Services, Division of Medical Assistance and Health Services:

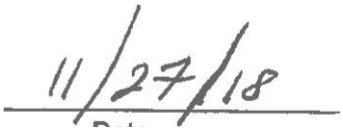
Signature: 

Date

Roxanne Kennedy, DSW Candidate:

Roxanne Kennedy, DSW Candidate

Signature:



Date

#1

THE DEPARTMENT HUMAN SERVICES (DHS)

DIVISION OF MEDICAL ASSISTANCE AND HEALTH SERVICES (DMAHS),

AND

ROXANNE KENNEDY

FOR

BEHAVIORAL HEALTH HOME EVALUATION PROJECT

This Amendment #1 ("Amendment") to the 2017 MOA (as hereinafter defined) is made and entered into by and between Roxanne Kennedy, having an address of 24 N. Congress Street, Newtown, PA 18940, and the Department of Human Services ("DHS"), Division of Medical Assistance and Health services ("DMAHS"), located at 7 Quakerbridge Plaza, P.O. Box 712, Trenton, NJ 08625 (Collectively referred to as the "Parties").

WITNESSETH

WHEREAS, Roxanne Kennedy and DMAHS previously entered into a Memorandum of Agreement (the "2017 MOA") dated January 18, 2017, for the purpose of evaluating the effectiveness of DMAHS's Behavioral health Homes in conjunction with Roxanne Kennedy's doctoral research at the University of Pennsylvania; and .

WHEREAS, Sections 11.3. and VI of the 2017 MOA specify that Stuart Dubin, an individual who is no longer employed by DMAHS, is the primary contact for DMAHS; and

WHEREAS, Section 111. 1 of the 2017 MOA specifies that Dan Treglia, Ph.D. , an individual who is no longer employed by Roxanne Kennedy, is Roxanne Kennedy's staff; and

WHEREAS, the Parties wish to amend the MOA, specifically insofar as contact and staff members for both Parties have changed since the original MOA was signed in 2017 and new contact and staff members have been appointed;

NOW THEREFORE, in consideration of the foregoing recitals and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties hereto, intending to be legally bound hereby, agree to the following:

1. Paragraph 11.3 of the 2017 MOA is hereby amended to reflect that the primary contact for DMAHS is Joseph Vetrano, Director of the Office of Business Intelligence for DMAHS (or a successor to this position) for the duration of the MOA or until such time as further amendment is made to the 2017 MOA; and

2. Paragraph 1 11.1 of the 2017 MOA is hereby amended to reflect that Roxanne Kennedy's staff is Michelle Evans-Chase for the duration of the MOA or until such time as further amendment is made to the 2017 MOA; and

3. Paragraph V of the 2017 MOA is hereby amended to reflect the revised contact information for Joseph Vetrano, Director of the Office of Business Intelligence for DMAHS, as follows:

Joseph Vetrano
Director Of the Office of Business Intelligence
7 Quakerbridge Plaza
P.O. Box 712
Trenton.NJ 08625
Joseph.Vetrano@dhs.state.ni.us
609-588-2673

4. Except as set forth in this Amendment, the 2017 MOA is unaffected and shall continue in full force and effect in accordance with its terms. If there is any conflict between this Amendment and the 2017 MOA, the terms of this Amendment will prevail.

5. The parties agree to the form and content of this Amendment and agree that this Amendment shall become effective as of the February 2018.

New Jersey Department of Human Services, Division of Medical Assistance and Health Services:

Signature: ure: Meghan Davey, Director Date

Roxanne Kennedy, DSW Candidate:

Signature: Roxanne Kennedy, DSW Candidate 2/13/18 Date

MEMORANDUM OF AGREEMENT (MOA)

BETWEEN

THE DEPARTMENT OF HUMAN SERVICES (DHS)
DIVISION OF MEDICAL ASSISTANCE AND HEALTH SERVICES (DMAHS)

AND

ROXANNE KENNEDY

FOR

BEHAVIORAL HEALTH HOME EVALUATION PROJECT

WHEREAS through state plan amendment, DMAHS implemented a Behavioral Health Homes program in July 2014 in two counties with the goal of improving health outcomes, reducingcosts, and advancing the overall wellness of the consumers being served, and

WHEREAS Roxanne Kennedy, DSW Candidate, as part of her doctoral research at the University of Pennsylvania, wishes to perform an evaluation of the effectiveness of Behavioral Health Homes under the New Jersey Medicaid program for DMAHS, which she entitles
"Evaluating the Effectiveness of Integrated Care Interventions for Individuals will) Serious
Mental Illness " and
WHEREAS Rutgers, Stale University of New Jersey, Center for State Health Policy (CSHP), within the Institute for Health, Health Care Policy, and Aging is uniquely positioned to provide support for this by preparing a data set to be used for this evaluation, and

WHEREAS DMAHS and Roxanne Kennedy desire to work together for the benefit of DMAHS's programs for an evaluation of the effectiveness of DMAHS's Behavioral Health Homes for the period of one year following a claim by a Behavioral Health Home provider for aa individual.

NOW, THEREFORE, THE PARTIES IIDRETO, DMAHS AND ROXANNE KENNEDY, AGREE AS FOLLOWS:

1. Scope of Work

DMAHS will provide. Roxanne Kennedy with limited data sets of data as follows:

(1) for individuals with the behavioral health home procedure code H0046, an encrypted ID and the electronic health record data encrypted to DMAHS pursuant to the State Plan requireent for Body Mass Index, PBQ9 measure, Care Transition Record and for Blood Pressure; and

(2) for individuals with the behavioral health home procedure code H0046, as set forth below; and

(3) for comparison purposes, a data set as set of below of individuals of similar age, sex, ethnicity, diagnosis, and county of residence (counties contiguous to and Bergen Counties).

The limited data subsets (2) and (3) will include the following data elements:

- Encrypted I.D#
- Age
- Sex
- Ethnicity
- County of residence
- Claim data for one year prior to the initial BHH procedure code and one year after the initial BHH procedure code. Claim data will not include identification of any managed care company.
- Claim data for one year prior to 7/1/2014 for the comparison group and one year after. Claim data will not include identification of any managed care company.

Roxanne Kennedy will evaluate the data sets, including costs and utilization, to see if there is a measurable impact on health outcomes from the integrated care provided by New Jersey Medicaid behavioral health homes for individuals with serious mental' illness (the Project) during the time period.

The results of the evaluation will be shared by Roxanne Kennedy in detail with DMAHS staff.

The results of the evaluation will be used by Roxanne Kennedy for her doctoral presentation. This and any other disclosure related to this Project will be de-identified according to the safe harbor requirements of HIPAA (no identifiers as set forth in 45 CFR 164.514 or any other reference to an individual in a way that the individual could be identified).

II. Obligations DMAHS

1. DMAHS shall provide to Roxanne Kennedy the data sets as set forth above.

2. DMAHS will respond to reasonable questions about the data sets as the evaluation work is being performed.

3. The primary contact for DMAHS will be Stuart Dubin, Director of the Office of Business Intelligence for DMAHS (or a successor to this position),

4. In addition to the above, DMAHS is required to abide by all general requirements contained in Sections IV and V of this MOA.

III. Obligations of Roxanne Kennedy

l . Roxanne Kennedy and her staff for this Project, Dan Treglia PhD (staff), shall have access to and use the data sets provided by DMAHS for accomplishing the evaluation for the Project subject 'o a Data Use Agreement signed by DMAHS and Roxanne Kennedy.

2. Work Product. Except for the de-identified summary of the Project entitled "Evaluating the Effectiveness of Integrated Care Interventions for Individuals with Serous Mental Illness," to be presented by Roxanne Kennedy in written and verbal form for her doctoral requirements, all other data, technical information, materials gathered, originated, developed. prepared, used or obtained in the performance of the Project, including but not limited to, all papers, reports, surveys, plans, charts, records, analyses or publications produced for or as a result of this MOA (hereinafter "work product") shall be DMAHS's property. No other work product produced utilizing data obtained under this MOA shall be released without the prior review and approval of the DMAHS.

3. Roxanne Kennedy will meet with and share the outcome of the evaluation under the Project with DMAHS in detail so that the NJ Medicaid program can benefit and fully understand the results of her evaluation.

4. Confidentiality of Data, Except for the de-identified summary of the Project resultes entitled "Evaluating the Effectiveness of Integrated Care Interventions for Individuals with Serious Mental Illness," to be presented by Roxanne Kennedy in written and verbal form for her doctoral requirements, all data obtained either directly from DMAHIS or indirectly through the work on the Project to be considered confidential, and shall be solely for the use of DMAHS. Unless otherwise specified,

all statistical, personal, or other data in any form which ate furnished, produced, or otherwise available to Roxanne Kennedy or her staff during the performance of this MOA are considered confidential and shall not be used for purposes other than performances of work under this MOA.

5. Roxanne Kennedy will not work on this Project during her normal DHS work hours, and she will not, in her current position at DHS, access any DHS behavioral health home data for the purposes of this this Project or access any other DHS data or information for the purposes of this Project other than what is provided to her under the Data Use Agreement that she is signing with DMAHS or any additional data she may receive from DHS under another agreement signed by DHS and Roxanne Kennedy. Roxanne Kennedy will comply with New Jersey Uniform Ethics Code and DHS ethics policies for this project which include the Requirements that "[n)o State officer or employee or special State officer or employee should use or attempt to use his/her official position (o secure unwarranted privileges or advantage for him/herself or others." And "[n)o State officer or employee or special State officer or employee, shall willfully disclose to any person, whether or not for personal gain, any information not generally available to members of the public which he/she receives or acquires in the course of and by reason of his/her official duties. No State officer or employee or special State officer or employee shall use for the purpose of pecuniary gain, whether directly or inditectly, any information not generally available Lo members of the public which he/she receives or acquires in the course of and by reason of his/her official duties."
6. In addition to the above, Roxanne Kennedy is to abide by all general requirements contained in Sections IV and V of this MOA.

V. General Provisions

1. During the term of this MOA, both parties shall comply with all federal, state and municipal laws, rules and regulations applicable to the activities performed pursuant to this MOA.

2. Each party shall establish appropriate administrative, technical and physical safeguards to protect the confidentiality of all data, and to prevent unauthorized use or access to these data. Each party must comply with all federal and state statutes and regulations governing the confidentiality and release of all Medicaid data and reports, including but not limited to 42 CFR 431.300-305, NJSA 30:4D-7.g and NJAC 10:49-9.7, as to the privacy provisions contained in the Health Insurance Portability and Accountability Act of 1996 as amended by the Health Information

Technology Economic and Clinical Health Act of 2009 (the "HITECH Act"), and regulations at 45 CER. 160, 45 C.F.R. 162, and 45 CER. 164.

3. Each of the parties is an independent entity and neither party shall hold itself out as an agent, partner or representative of the other.

4. Failure by either party to exercise any right or demand performance of any obligation under this MOA shall not be deemed a waiver of such right or obligation.

5. If any of the provisions of this MOA are, or become invalid, 10 any extent, the other provisions of this MOA shall not be effected thereby. In the event of the invalidity of a provision, the parties agree to accept a provision which reflects as closely as possible the intention of the invalid provision.

6. This MOA may not be assigned without the prior written consent of the DMAHIS.

7. The laws of the State of New Jersey govern this MOA.

8. Between DMAHS and Roxanne Kennedy, subject to the permissions of the New Jersey Tort Claims Act and the New Jersey Contractual Liability Act, DMAHS shall be responsible for, and shall at its own expense, defend itself against any and all suits, claims, losses, demands or damages of whatsoever kind or nature, arising out of or in connection with any act or omission of DMAHS, its employees, agents or contractors, in the performance of the obligations assumed by DMAHS pursuant to this MOA. DMAHS hereby releases Roxanne Kennedy whom any and all liabilities, claims, losses, costs, expenses and demands of any kind or nature whatsoever, arising under State or Federal law, solely out of or in connection with DMAHS's performance of the obligations assumed by DMAHS pursuant LO the MOA.

9. Between DMAHS and Roxanne Kennedy, subject to the provisions of the New Jersey 'f01t Claims Act and the New Jersey Contractual Liability Act, Roxanne Kennedy, on behalf of herself and her staff, shall be responsible for, and shall at her own expense, defend herself against any and all suits, claims, losses, demands or damages of whatsoever kind or nature, arising out of or in connection with any act or omission of Roxanne Kennedy or her agents or contractors, in the performance of the obligations assumed by Roxanne Kennedy pursuant to this MOA. Roxanne Kennedy hereby releases DMAHS flX)m any and all liabilities, claims, losses, costs, expenses and demands of any kind of nature whatsoever, arising under State of Federal law, solely out of or in connection with Roxanne

Kennedy (and her staff)'s performance of the obligations assumed by Roxanne Kennedy under this MOA,

10. Any and all publicity and/or public announcements relating to this MOA shall be reviewed and approved in writing by all parties prior to release or distribution, All parties must be in agreement Prior to any release or distribution unless required as part of a legal proceeding.

VI. Terms and Termination

A. Subject to any rights of termination hereinafter set forth, this MOA shall become effective on the date it is fully executed and shall valid for one year or until the Project is complete and the results of the Project are presented to DMAHS and for doctoral requirement purposes including a doctoral defense, final approval by the doctoral committee and publication on the University of Pennsylvania Scholarly Commons website. DMAHS will pre-approve any publication consistent with paragraph IV .10.

B. This MOA may be terminated by either party without cause upon thirty (30) days advance written notice.

C. Notice of termination shall be delivered via U.S. mail, return receipt requested, and shall be effective upon receipt. Notice shall be sent to the appropriate contact person identified at Section VI.

VII: Principal Contacts

The principal contacts for all notifications required or otherwise necessary under this MOA shall be as follows:

For DMAHS:

Stuart Dubin
Director of the Office of Business Intelligence
7 Quakerbridge Plaza
PO 712
Trenton, NJ 08625
Stuart.Dubin@dhs.state.nj.us
609-584-2954

For ROXANNE KENNEDY:

Name and title: Roxanne Kennedy, DSW Candidate
Address: 24 N, Congress Street, Newtown, PA 18940

Email: Krox@sp2.upenn.edu
Phone number: 267-980-2374

Vil. We, the undersigned, consent to the contents of this MOA.

Director, DMAHS

DMAHS:

Signature; 1/18/17 Date

Roxanne Kennedy. l)S.u:

Roxanne Kennedy, DSW Candidate

Signature: Roxanne Kennedy, date 1/17/17 Date

#3

BETWEEN THE

DEPARTMENT OF HUMAN SERVICES

AND

ROXANNE KENNEDY

FOR

BEHAVIORAL HEALTH HOME EVALUATION PROJECT

This Amendment #3 ("Amendment #3") to the 2017 DUA (as hereinafter defined) is made and entered into by and between Roxanne Kennedy, having an address of 24 N. Congress Street, Newtown, PA 18940, and the Department of Human Services ("DHS"), Division of Medical Assistance and Health services ("DMAHS"), located at 7 Quakerbridge Plaza, P.O. Box 712, Trenton, NJ 08625 (Collectively referred to as the "Parties").

WITNESSETH

WHEREAS, Roxanne Kennedy and DMAHS previously entered into a Data Use Agreement (the "2017 DUA") dated January 5, 2017, in order to facilitate the sharing of certain data between the Parties; and

WHEREAS, Section B.3 of the 2017 DUA was amended on February 16, 2017 (Amendment #1) and then again on February 15, 2018 (Amendment #2), to reflect staffing changes; and

WHEREAS, the Parties wish to amend the 2017 DUA, to the scope of the data DMAHS will provide to Roxanne Kennedy and her staff since the DUA was signed in 2017;

NOW THEREFORE, in consideration of the foregoing recitals and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the hereto, intending to be legally bound hereby, agree to the following:

1. Paragraph B.l of the 2017 DUA, with respect to the specifications for the limited data subsets (2) and (3), is hereby amended to reflect the following:

   The limited data subsets (2) and (3) will include the following data elements:

   - Encrypted ID#
   - Age
   - Sex
   - Ethnicity
   - County of residence

- Claim data for one year prior to the initial BHH procedure code that occurs during or after 2014 and through December 31, 2017. Claim data will not include identification of any managed care company.
- Claim data for one year prior to July 1, 2014 for the comparison group and through December 31, 2017. Claim data will not include identification of any managed care company.
- Any other available data that DMAHS authorizes to be provided relevant to this population.

2, Except as set forth in this Amendment #3, the 2017 DUA is unaffected and shall continue in full force and effect in accordance with its terms. If there is any conflict between this Amendment #3 and the 2017 DI-JA, the terms of this Amendment will prevail.

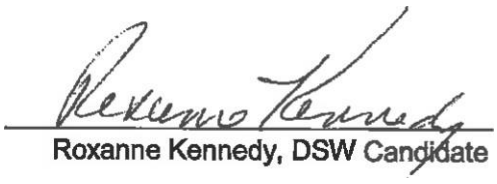
3. The parties agree to the form and content of this Amendment #3.

New Jersey Department of Human Services, Division of Medical Assistance and Health Services:

Signature: 

3/29/19
Date

Data Recipient Roxanne Kennedy:



Signature:

3/22/19
Date

#2

BETWEEN

AND

ROXANNE KENNEDY

FOR

BEHAVIORAL HEALTH HOME EVALUATION PROJECT

This Amendment #2 ("Amendment #2") to the 2017 DUA (as hereinafter defined) is made and entered into by and between Roxanne Kennedy, having an address of 24 N. Congress Street, Newtown, PA 18940, and the Department of Human Services ("DHS"), Division of Medical Assistance and Health services ("DMAHS"), located at 7 Quakerbridge Plaza, P.O. Box 712, Trenton, NJ 08625 (Collectively referred to as the "Parties").

WITNESSETH

WHEREAS, Roxanne Kennedy and DMAHS previously entered into a Data Use Agreement (the
"2017 DI-JA") dated January 5, 2017, in order to facilitate the sharing of certain data between the Parties; and

WHEREAS, Section B.3 of the 2017 DUA specifically named Dan Treglia, Ph.D., as Roxanne Kennedy's sole staff member: and

WHEREAS, Section B.3 of the 2017 DUA was amended on February 16, 2017 through Amendment #1 to the DUA to reflect a change in Roxanne Kennedy's staff from Dan Treglia, Ph.D to Michelle Evans-Chase; and

WHEREAS, Michelle Evans-Chase. is no longer employed by Roxanne Kennedy; and

WHEREAS, the Parties wish to amend the 2017 DUA specifically insofar Roxanne Kennedy's staff has changed since the Amendment #1 to the DUA was signed in 2017 and a new staff member has been appointed;

NOW THEREFORE, in consideration of the foregoing recitals and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties hereto, intending to be legally bound hereby, agree to the following:

1. Paragraph B.3 of the 2017 DUA is hereby amended to reflect that Roxanne Kennedy's staff is Kristen Lloyd for the duration of the DUA or until such time as further amendment is made to the 2017 DI-JA.

2. Except as set forth in this Amendment #2, the 2017 DUA is unaffected and shall continue in full force and effect in accordance with its terms. If there is any conflict between this Amendment #2 and the 2017 DUA, the terms of this Amendment will prevail.

3. The parties agree to the form and content of this Amendment #2 and agree that this Amendment #2 shall become effective as of the November Al, 2018.

New Jersey Department of Human Services, Division of Medical Assistance and Health Services:

ture: Meghan Davey, Director

Signature:

11/30/18

Da e

Data Recipient Roxanne Kennedy:

Roxanne Kennedy, DSW Candidate

November 27, 2018

Signature:

Date

#1

BETWEEN

THE DEPARTMENT OF HUMAN SERVICES

AND

ROXANNE KENNEDY

FOR

BEHAVIORAL HEALTH HOME EVALUATION PROJECT

This Amendment #1 ("Amendment") to the 2017 DUA (as hereinafter defined) is made and entered into by and between Roxanne Kennedy, having an address of 24 N. Congress Street, Newtown, PA 18940, and the Department of Human Services ("DHS"), Division of Medical Assistance and Health services ("DMAHS"), located at 7 Quakerbridge Plaza, P.O. Box 712, Trenton, NJ 08625 (Collectively referred to as the "Parties").

WITNESSETH

WHEREAS, Roxanne Kennedy and DMAHS previously entered into a Data Use Agreement (the
"2017 DUN) dated January 5, 2017, in order to facilitate the sharing of certain data between the Parties; and

WHEREAS, Section B.3 of the 2017 DUA specifically names Dan Treglia, Ph.D., as Roxanne Kennedys sole staff member. and

WHEREAS, Dan Treglia, Ph.D. is no longer employed by Roxanne Kennedy; and

WHEREAS, the Parties wish to amend the 2017 DI-JA, specifically insofar Roxanne Kennedy's staff has changed since the original MOA was signed in 2017 and a new staff member has been appointed;

NOW THEREFORE, in consideration of the foregoing recitals and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties hereto, intending to be legally bound hereby, agree to the following:

1 , Paragraph B.3 of the 2017 DUA is hereby amended to reflect that Roxanne Kennedy's staff is Michelle Evans-Chase for the duration of the DUA or until such time as further amendment is made to the 2017 DUA

2. Except as set forth in this Amendment, the 2017 DUA is unaffected and shall continue in full force and effect in accordance with its terms. If there is any conflict between this Amendment and the 2017 DUA, the terms of this Amendment will prevail.

3. The parties agree to the form and content of this Amendment and agree that this Amendment shall become effective as of the February L, 2018.

New Jersey Department of Human Services, Division of Medical Assistance and Health Services:

Signature: 

2/15/18
Date

Data Recipient Roxanne Kennedy:

Signature:1/8/18
Date

DATA USE AGREEMENT FOR BEHAVIORAL HEALTH HOME EVALUATION

This Data Use Agreement ("Arrestment") is made and entered into by and between the New Jersey Department of Human Services, Division of Medical Assistance and Health Services ("Covered Entity" and "DMAHS"), and Roxanne Kennedy having an address of 24 N Congress Street, Newtown, PA 18940 ("Data Recipient"). Data Recipient also includes Roxanne Kennedy's staff person, Dan Tregtia, PhD, whom she is paying to assist her with this evaluation and for whom she is responsible in regard to this evaluation project.

WITNESSETH:

WHEREAS, Entity may disclose or make available to Data Recipient, and Data Recipient may use, disclose, receive transmit, maintain or create from, certain information in accordance with 45 CFR § 514(e); and

WHEREAS, Covered Entity and Data Recipient committed to compliance with the Health Insurance Portability and Accountability Act of 1996 ("HIPAA") and the Health Information Technology for Economic and Clinical Health (HIIECH) Act of the American Recovery and Reinvestment Act of 2009, P.L. 1 t -5, and regulations promulgated under those Acts (45 C.F.R. 160 through 164); and

WHEREAS, the purpose of this Agreement is to satisfy the obligations of Covered Entity under HIPAA and HITECH and to ensure the integrity and confidentiality of certain information disclosed or made available to Data Recipient and certain information that Data Recipient uses, discloses, receives, transmits, maintains or creates, from the data provided by Covered Entity pursuant to this Agreement; and

NOW, THEREFORE, in consideration of the foregoing recitals and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto, intending to be legally bound herby, agree as follows:

A. DEFINITIONS

(Unless otherwise specified in this Agreement, all capitalized terms used in this Agreement not otherwise defined have the meaning established for purposes of the "HIPAA Regulations" codified at Title 45 parts 160 through 164 of the United States Code of Federal Regulations, as amended from time to time.

B. SCOPE AND PURPOSE

1. This Agreement sets forth the terms and conditions pursuant to which Covered Entity will disclose certain PHI to the Data Recipient. For this Project, Covered Entity will provide Data Recipient with Limited Data Sets as set forth below and in the MOA For Behavioral Health Home Evaluation Project between Covered Entity and Data Recipient:

(1) an encrypted ID number and electronic health record information for blood pressure and body mass index for any individual with a behavioral health home procedure code H0046 that is available to DMAHS at the time of cleating the limited data sets for this project; (2) a limited data SCI of data for individuals with the behavioral health home procedure code H0046; and (3) for comparison purposes, a limited data set of data for individuals of similar age, sex,

ethnicity, diagnosis, and county of residence (counties contiguous to and Bergen Counties), (the Limited Data Sets),

The Limited Data Sets (2) and (3) will include the following data elements—-

- Encrypted ID#
- Age
- Sex
- Ethnicity
- County of residence
- Claim data for one year prior to the initial BIIH procedure code and one year after the initial BHH code. Claim data will not include identification of any managed care company.
- Claim data for one year prior to 7/112014 for the comparison group and one year after. Claim data will not include identification of any managed company,

Data recipient will evaluate the Limited Data Sets for impact on health outcomes from the integrated care provided by New Jersey Medicaid behavioral health homes for individuals with serious mental illness as set forth in the MOA For Behavioral Health Home Evaluation Project.

2. Except as otherwise specified Data Recipient may use the Limited Data Sets only for the purposes of DMI•IAS health care operations as described in this Agreement and in the MOA For Behavioral Health Home Evaluation Project. Data Recipient will not reveal to any other person or entity the encrypted ID numbers that have been linked to a Medicaid individual nor will it share the Limited Data Sets with any other person or entity.

3. The Limited Data Sets will be maintained by Data Recipient at the University of Pennsylvania in an appropriately environment. The following individuals will have access to the Limited Data Sets on behalf of Data Recipient: Roxanne Kennedy and Dan Treglia, PhD. Data Recipient will not share any data from the Limited Data Sets with any other persons, entities, or providers.

4. The results of the. Project will be shared with Covered Entity to assist Covered Entity in administering its programs. All results of the Project to be shared outside of Data Recipient for the requirements of Roxanne Kennedy's doctoral presentation will be de-identified consistent with the HIPAA "safe harbor" dc-identification requirements at 45 CFR 164.514(b).

C. OBLIGATIONS AND REQUIREMENTS OF DATA RECIPIENT

(1) Data Recipient agrees to not use or disclose the Limited Data Sets for any purpose other than to conduct the work for the MOA For Behavioral Health Home Evaluation Project, or as required by law.

2, Data Recipient to use appropriate safeguards to prevent use or disclosure of the Limited Data Sets other than as provided for by this Agreement.

3. Data Recipient agrees to report, in writing, to the Covered Entity any use or disclosure of the Limited Data Sets not provided for by this Agreement, of which it becomes aware, including without limitation, any disclosure of PHT to an unauthorized individual or entity, within ten (10) days of its discovery.

4. Data Recipient will ensure that its staff person and any agent, including a subcontractor, to whom it provides Limited Data Sets' data agrees to the same restrictions and conditions that apply through• this Agreement to the Data Recipient with respect to such information. Data Recipient will inform Covered Entity of the data sharing of Covered Entity's Limited Data Sets with a subcontractor other than the defined staff person for the MOA For Behavioral Health Home Evaluation Project purposes thirty (30) days prior to doing so and will obtain Covered Entity's consent in advance of allowing the agent or subcontractor access.

5. Data Recipient agrees to not identify the information contained in the Limited Data Sets or contact any individual who is the subject of PHI contained in the Limited Data Sets.

6. Data Recipient shall indemnify, defend, and hold harmless Covered Entity and all of Covered Entity's affiliates, and their respective officers, directors, employees, and agents ("Indemnities") from and against any potential or asserted claim, cause of action, liability, damage, cost, or expense (including, without limitation, the costs of investigation and settlement, and reasonable attorney's fees and court costs) arising out of or in connection with any unauthorized or prohibited use or disclosure of the Limited Data Sets or any other bleach of this Agreement by Data Recipient or its agent or a person under Data Recipient's control, or any Data Recipient subcontractor.

D. TERM AND TERMINATION

The provisions of this Agreement shall be effective as of the date it is fully executed and shall terminate on the earlier to occur at the conclusion or termination of the evaluation project under the MOA For Behavioral Health Home Evaluation Project, or (ii) the termination of this Agreement by one party giving written notice of termination to the other party, Upon termination, all of the Limited Data Sets provided by Covered Entity to Data Recipient shall be destroyed or turned to Covered Entity (including al] data used by Data Recipient's agents), or, if it is infeasible to return or destroy the Limited Data Sets, Data Recipient shall use its best efforts to ensure that all necessary protections arc extended to such information, to ensure that the Limited Data Sets not disclosed 10 any other party unless expressly authorized 10 use or disclose the Limited Data Sets through this Agreement.

E. MISCELLANEOUS

1. A in this Agreement to a section in the Privacy Rule shall be deemed to be revised, as appropriate, to mean the section as amended or as numbered.

2. The parties agree to take such action as is necessary to amend this Agreement from time to time as is necessary for Covered Entity to comply with' the requirements of HIPAA and HITECH.

3. The obligations of Data Recipient under Section C of this Agreement shall survive termination of this Agreement.

4. Any ambiguity in this Agreement shall be resolved to permit Covered Entity to comply with HIPAA and HITECH.

5. There are no intended third party beneficiaries to this Agreement. Without in any •way limiting the foregoing, it is the parties' specific intent that nothing contained in this Agreement gives rise to any right or cause of action, contractual or otherwise, in or on behalf of the individuals whose PHI is used or disclosed pursuant to this Agreement.

6. No provision of this Agreement may be waived except by an agreement in writing signed by the waiving party. A waiver of any bleach or non-compliance with any term or provision shall not be construed as a waiver of any other term or provision, or of any subsequent breach or non-compliance with the same term or provision.

7.The signing below recipient and CE certify that each has the rightly and authority to execute this on behalf of their respective parties and no further approvals are necessary to create a binding agreement.

8. In the event of any conflict between the terms and conditions stated in this Agreement and those contained in any other agreement or understanding between the parties, written, oral or implied, the terms of this Agreement shall govern. Without limiting the foregoing, no provision of any other agreement or understanding between the parties limiting the liability of Data Recipient to Covered Entity shall apply to the breach of any covenant in this entby Data Recipient.

9. This Agreement shall be construed in accordance with and governed by the laws of the State of New Jersey, without regard to the conflict of laws and principles thereof.

IN WITNESS WHEREOF, the parties have executed this Agreement.

COVERED ENTITY	DATA RECIPIENT
Division of Medical Assistance and Health	Roxanne Kennedy Services
By: Date:	By: Date: 1/5/17
Name: Meghan M. Davey Title: Director	Name: Roxanne Kennedy, DSW Candidate

APPENDIX D - Letter of Support

State of New Jersey

DEPARTMENT OF HUMAN SERVICES
DIVISION OF MEDICAL ASSISTANCE AND HEALTH SERVICES
P.O. Box 712
Trenton, NJ 08625-0712

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

ELIZABETH CONNOLLY
Acting Commissioner

MEGHAN DAVEY
Director

April 21, 2016

Roxanne Kennedy, MSW, LCSW, DSW Candidate
University of Pennsylvania
School of Social Policy and Practice
3701 Locust Walk
Philadelphia, PA 19104-6214

Dear Ms. Kennedy:

On behalf of the New Jersey Division of Medical Assistance and Health Services' (DMAHS) Medicaid Program, I am pleased to offer my support for your proposal to conduct a study to evaluate the health outcomes, health care costs and utilization of New Jersey Medicaid beneficiaries with serious mental illness. Integrated physical and behavioral health care is of great importance to me and I believe your proposed project will generate actionable health intelligence for our NJ FamilyCare program.

I understand you are working with the Rutgers Center for State Health Policy (CSHP) to obtain information necessary for this study. My office will facilitate the necessary Data Use Agreement between DMAHS and CSHP that would allow CSHP to share with you certain DMAHS data that CSHP is using for other projects. My office will also facilitate the necessary Data Use Agreement between DMAHS and you that would allow DMAHS to share this data for the purposes of this project. I understand that the data exchanged will be de-identified information via a limited data set. As you are aware, data sharing can only proceed following the execution of a Data Use Agreement that complies with the Health Insurance Portability and Accountability Act and other applicable laws.

Thank you for your interest in improving the care of NJ FamilyCare beneficiaries and I look forward to working with you.

Sincerely,

Meghan Davey
Director

MD:pm

New Jersey Is An Equal Opportunity Employer